
smilics
TECHNOLOGIES
i2grid
smilics
The most comprehensive solution on the market for **digitizing low-voltaje transformer stations**


We believe in energy transition, sustainability, technology
at the service of people and environmental protection.

We are a Global Company

Smilics Technologies is a specialist company that provides the necessary tools for the measurement, control and exploitation of energy consumption in sectors such as residential, businesses, industrial and the electrical infrastructure companies. It is part of "The Yellow Nest" group, a global business group formed by six companies serving over 80 countries around the world. It provides innovative solutions in the field of energy efficiency through products and cutting-edge technology applications, leading the transformation of the electricity sector.

With over 30 years of experience, Smilics Technologies stands out as a company specialized in the design and manufacture of cutting-edge devices and software at our headquarters in Terrassa (Barcelona). We have our own R&D and production departments that ensure we meet the highest quality standards required in the industry.

Quality: ISO 9001, 14001 y 45001

Driving **energy digitalization** for a more **sustainable** future

At Smilics Technologies, our mission is to drive energy digitalization toward a more sustainable future. To achieve this, we develop and manufacture advanced tools in Barcelona, designed for sectors such as residential/tertiary, industrial, and electricity distribution networks.

We offer comprehensive solutions that range from sensor technology to cloud-based software, including the development of electrical measurement and management devices.

SOFTWARE

Wibeee Nest

2Grid Platform

METERS

Solutions for monitoring and management of industrial, tertiary and domestic installations.

LV Monitoring Solutions

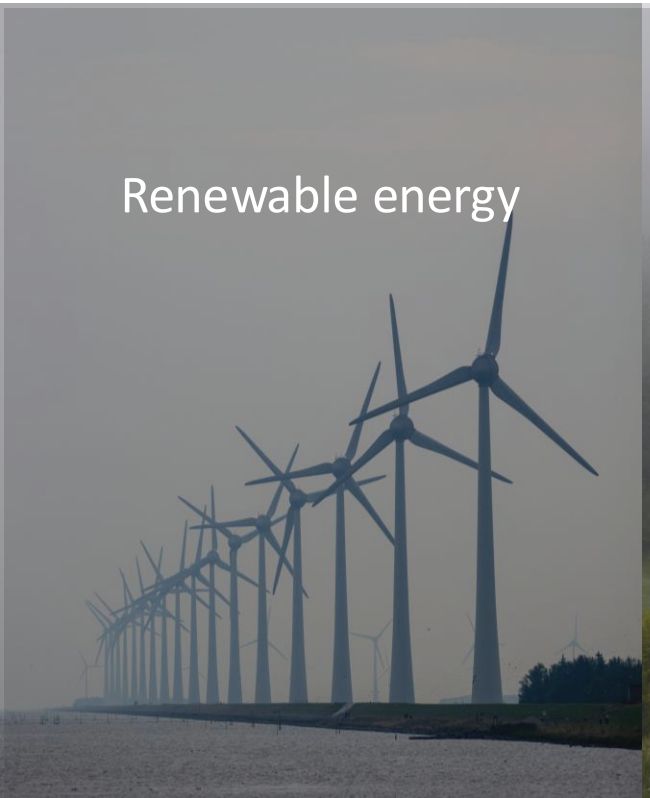
SENSORS

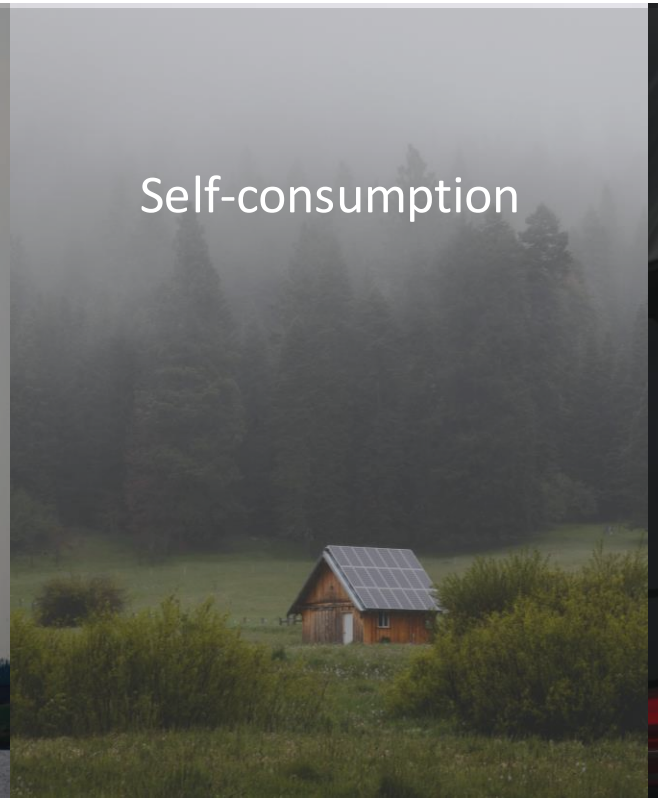
Our clients trust us

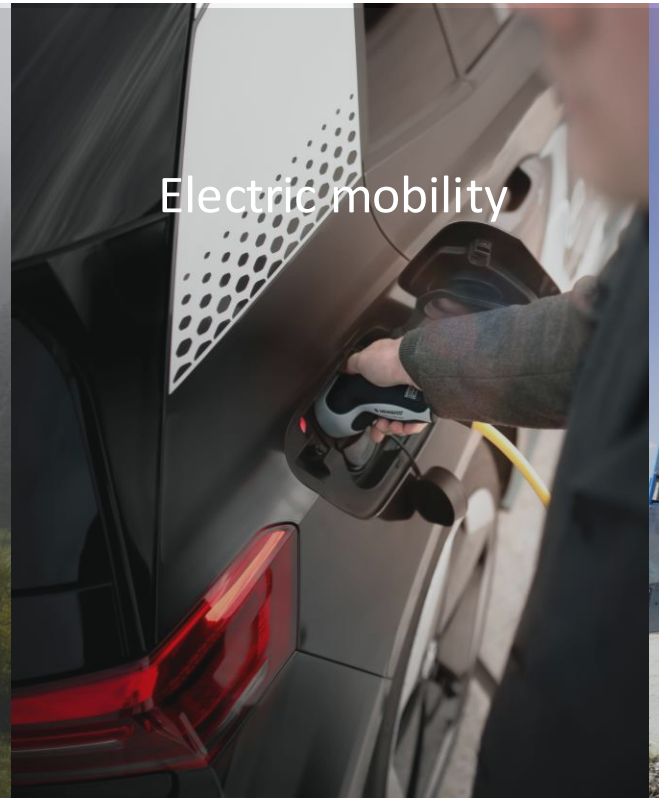
we digitize energy

The **digitalization** of electrical networks is essential for the energy transition

The digitalization and automation of electrical networks **allows total interconnectivity in real time, knowing the status** of each node, segment and element of the network, and **increasing the operational efficiency and effectiveness of the lines**.







Why do we have to digitize the network?

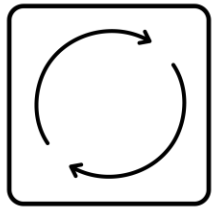
- **Ensure network quality:** Constant monitoring improves the reliability of the network, thus increasing its quality.
- **Avoid network failures:** Detect problems in the initial stages, before they develop and cause damage to the power lines.
- **Improve network efficiency:** A digitalized network allows you to identify energy losses that occur and reduce operating costs.
- **Adapt to new requirements:** In Germany, for example, it is already mandatory by law that all electrical networks must be monitored and controlled (EnWG article 14a). It is a matter of time before these regulations are extended to the rest of the countries of the European Union as they are in line with the SDGs set out in the 2030 agenda.
- **Analyze data and track trends:** Digitalization makes it possible to analyze the behavior of the network in search of trends to better plan and optimize the electrical network.
- **Protect sensitive equipment:** Monitoring harmonics allows you to improve the useful life of the equipment installed on a network and minimizes the time it is inactive.

What is 2grid?

It is a complete solution for LV supervision and control of secondary substations for electricity distribution companies.

Each device has been designed to provide an accurate analysis of the interior of a secondary distribution station.

What can you expect from the 2GRID solution?



Real-time information

Key parameters of electrical transformers provide valuable information for preventive maintenance, early fault detection and performance optimization, extending the useful life of electrical assets and ensuring operational safety.

2 different formats

The 2grid solution is made up of various devices located in the transformation center. These are connected via Ethernet to the switch or router of the secondary substation, allowing efficient and secure communication for remote monitoring and control. This optimizes energy management.

Maximum Cybersecurity

All 2grid devices have been precisely designed to analyze the interior of the secondary substation. In addition, they have robust cybersecurity measures, thus guaranteeing maximum protection and security of the electrical infrastructure.

Easy Installation

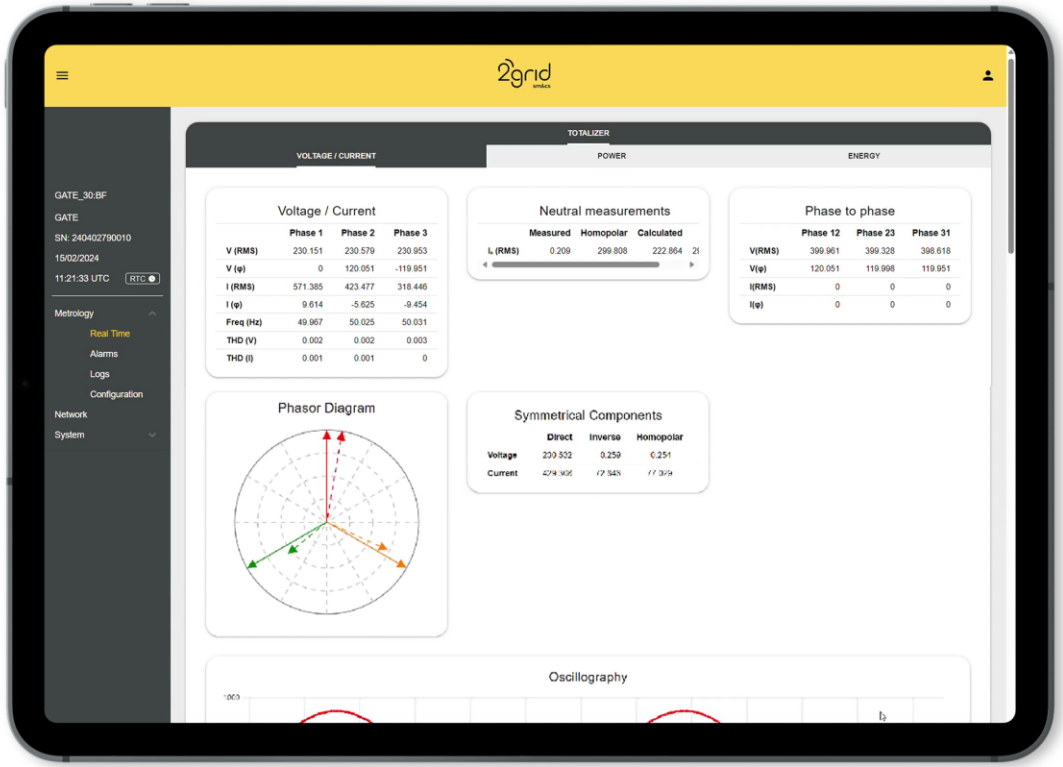
2grid devices are installed without interrupting the power supply, minimizing disruption and ensuring continuity of service. The “plug and play” approach allows rapid digitization of an entire secondary substation, without the need to request downloads on the line.

Let’s Bring Some Light to the 2grid Characteristics

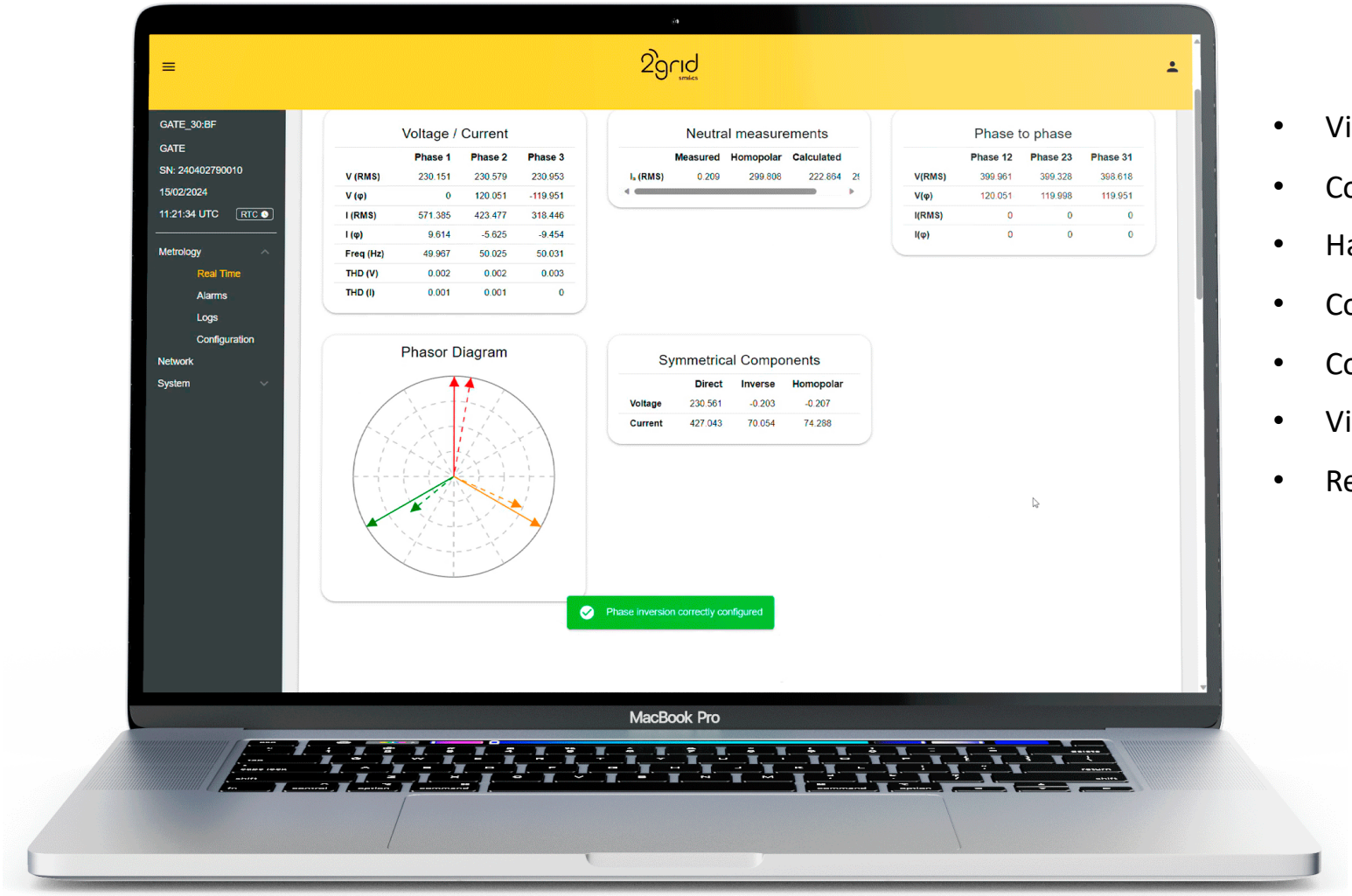
Monitoring and control in real time

Your network, under complete control

Complete solution for the supervision and control of low voltage transformation centers for electric power distribution companies. We offer grid professionals access to transformer performance data.



What can be done with the device's internal web?



- View the measured parameters in real time.
- Configure alarms and view their status.
- Have access to your device’s event log.
- Configure the device’s communication protocols.
- Configure and customize graphs that display measured data.
- View, create and edit users and their permissions.
- Reset the equipment and make the relevant updates.

CommPack Solutions

Whatever type of substation you have, with CommPack you can monitor it.

¡NEW!

2Grid CommPack

2Grid CommPack is available in two versions so that it can be installed in both a pole transformer and a ground transformer substation.

¡NEW!

2Grid CommPack

Whatever type of substation you have, with CommPack you can monitor it.

CommPack range general characteristics:

- IP67 protection.
- Self-powered in phases.
- Neutral current measurement: Direct, calculated and homopolar.
- Secondary three-phase voltage measurement.
- Calculation of derived electrical quantities.
- Calculation of harmonics.
- Transformer oil temperature and pressure measurement.
- Parameterizable digital I/O.
- Measurement of outdoor ambient temperature.
- Event and alarm log.
- Internal web server for monitoring and configuration.
- 4G-LTE CAT-1 mobile communications.
- Communications: HTTPS (API/WEB), MQTTS, MODBUS TCP TLS.
- Compliance with high cybersecurity standards.

¡NEW!

2Grid CommPack PM1

2Grid® CommPack PM1 is a monitoring system designed to digitize transformers installed on power poles.

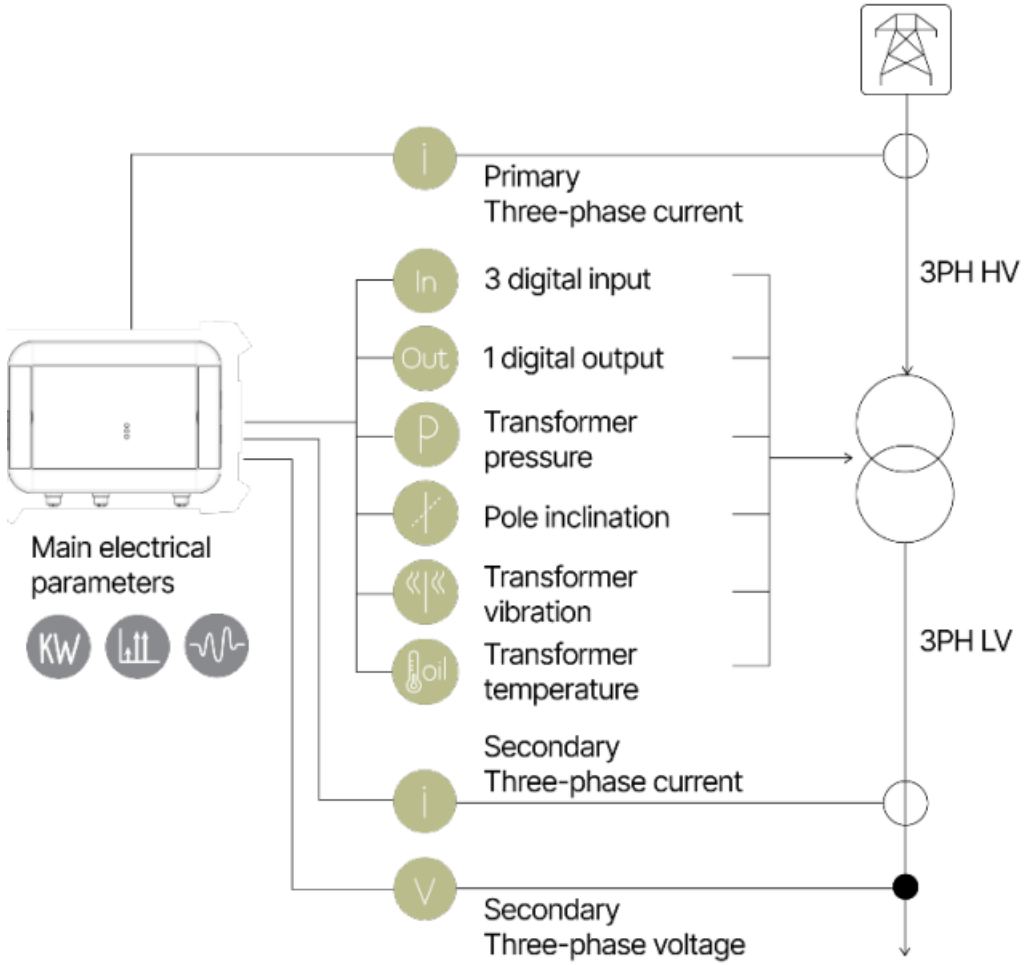
Equipment aimed at pole installation:

- Post tilt sensor.
- Pole vibration/impact detection.
- Measurement of primary and secondary three-phase currents.

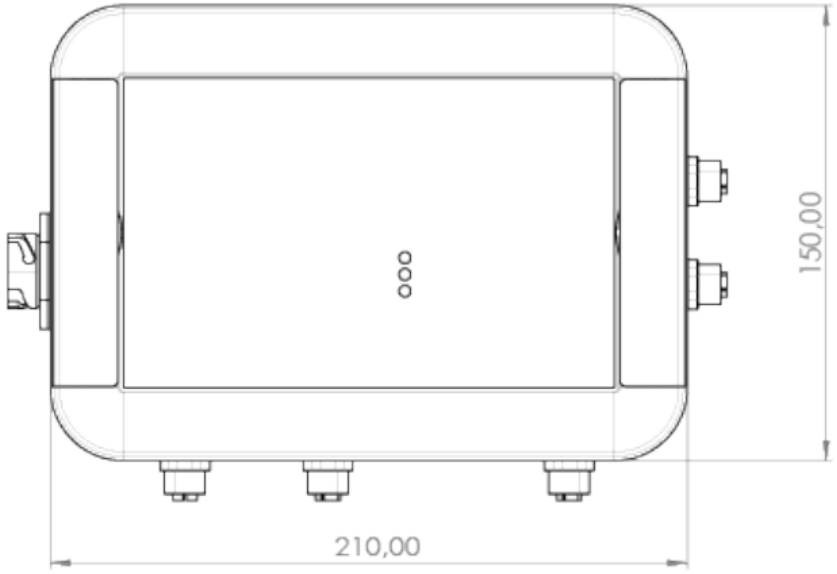
2grid CommPack PM1 - Application

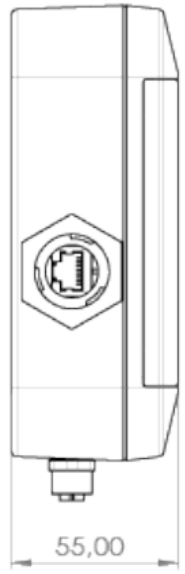
2Grid CommPack PM1 use cases:

- Detect a transformer overload
- Measure the quality of the electricity supply
- Detect power theft at the transformer level
- Detect illegal installations
- Provide information to customer service
- Immediate detection of the fault and location to send to the EPC.
- Detect transformer vibration and pole tilt



2grid smilics CommPack PM1 - Dimensions





2grid smilics CommPack PM1 - Technical Features

Electrical characteristics	
Power	10 VA
Input voltage	480/830 Vac
Frequency	50 – 60Hz
Voltage Input Range (PN)	0 – 480 Vac
Voltage Input Range (PP)	0 – 830 Vac
Current measurement range	0 - 4000 A
Current accuracy (primary/secondary)	± 1%
Voltage VLN	± 0.2%

Mechanical and physical characteristics	
Material	Plastic ABS | Flame resistant UL94 V0
Degree of protection	IP67
Installation	Pole mounted version (bracket or neodymium magnet) | DIN rail 35mm | Wall mount with 2 / 4 dowels (6 mm)
Temperature (Operation & Storage)*	-25ºC up to +70ºC
Relative humidity	0% hasta 93%
Pressure	70 hasta 106 kPa
Maximum altitude	2000 m
Degree of pollution	PD2

Safety and EMC	
Installation Category	IV EB 61010-1
Input Voltage Safety Category	IEC 61010-1 CAT IV 600V
Current safety category and temperature sensor, 24 V input, Ethernet	IEC 61010-1 CAT IV 150V
Electromagnetic Compatibility	Emission: IEC 61000-6-4 Immunity: IEC 61000-6-2

Communications	
Type	LTE 4G-LTE CAT-1 Ethernet 10/100 Base TX
Connector	RJ45 Blindado
Transmission Protocol	MODBUS TCP, MQTT, HTTP (Web/API), NTP, DCHP CLIENT

*According to standard IEC61557-12

2grid smilics CommPack PM1 - Technical Features

Cybersecurity

TPM 2.0 Cryptographic Hardware Accelerator

Secure firmware installation (SFI). Built-in security services to authenticate and protect software Intellectual Property while initial programming is being performed.

Cryptographic coprocessor with hardware-based secure key storage: Secure boot Secure firmware update (SBSFU).

Cryptographic functions: AES-128: Encrypt/Decrypt, Multiply in the Galois field for GCMn and HASH, SHA-1 and SHA-2 functions
(secure HASH algorithms), MD5, HMAC.

- Anti-tampering detection.
- Encrypted communications: HTTPS, MQTTS, MODBUS TCP TLS.

Test

ESD (Electrostatic Discharge)	IEC EN 61000-4-2
Ring wave	IEC EN 61000-4-12
Damped oscillatory waves	IEC EN 61000-4-18
Fast Transients/Bursts	IEC EN 61000-4-4
Power Frequency Magnetic Field	IEC EN 61000-4-8
Radiated RF electromagnetic field	IEC EN 61000-4-3
Radiated RF electromagnetic field (digital radiotelephone)	IEC EN 61000-4-3
Test voltage level at main freq. conducted	IEC EN 61000-4-16
Conducted CM disturb. (0-150Hz)	IEC EN 61000-4-16
Conducted disturbances	IEC EN 61000-4-6

Datasheet
CommPack PM1

¡NEW!

2Grid CommPack GM4

2Grid® CommPack GM4 is a monitoring system for Low Voltage transformer stations.

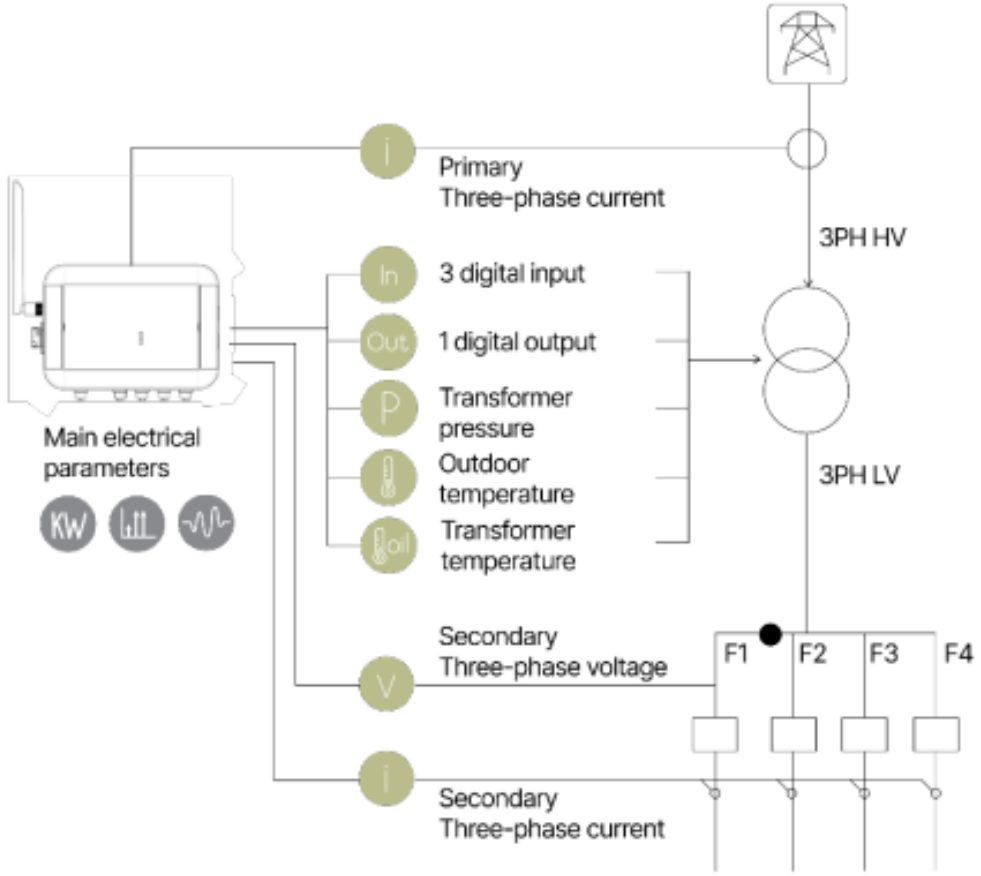
Equipment aimed at indoor CTs:

- 4 secondary three-phase current measurements.
- Primary three-phase current measurement
- Secondary three-phase voltage measurement.

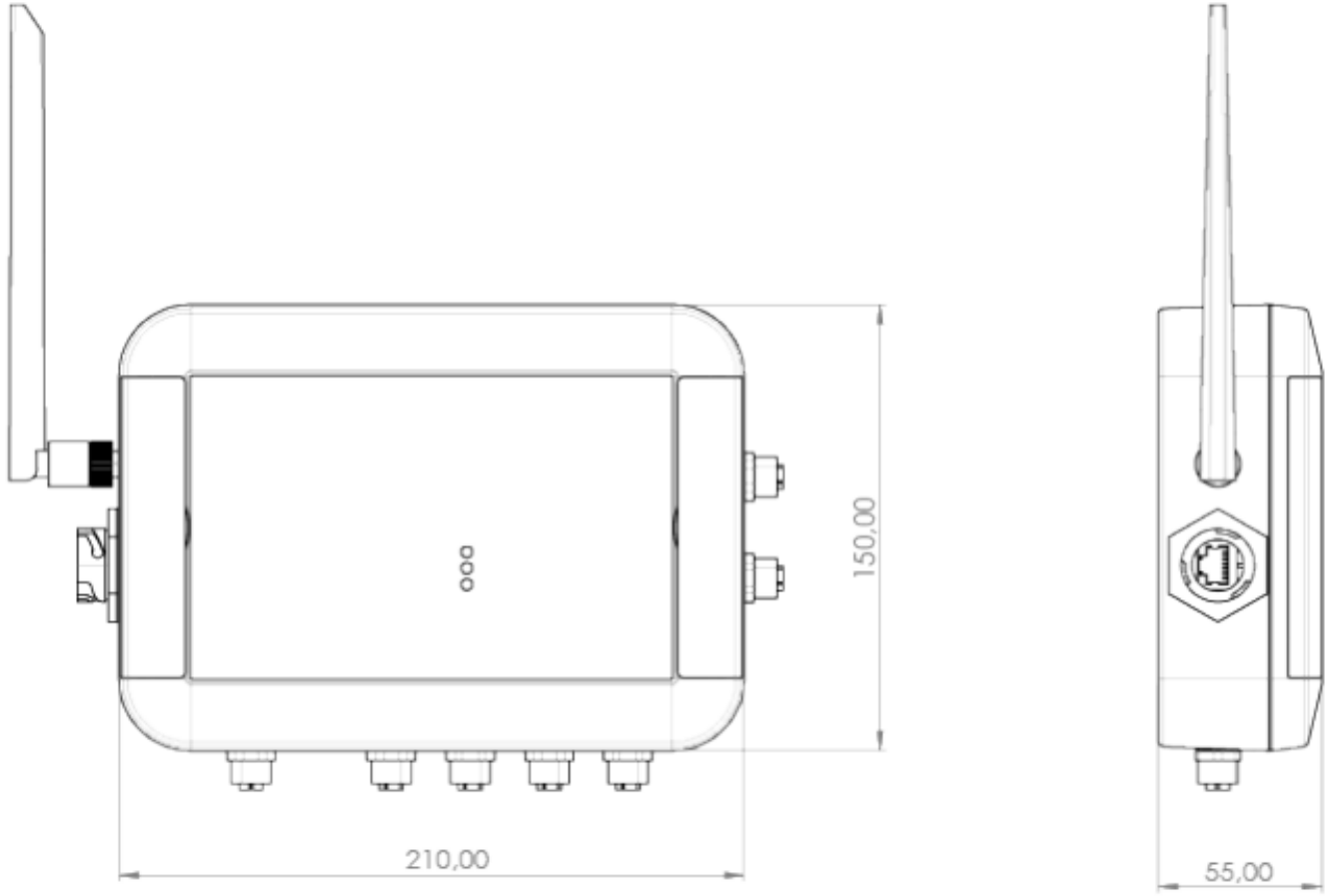
2grid CommPack GM4 - Application

2Grid CommPack GM4 use cases:

- Detect a transformer overload
- Measure the quality of the electricity supply
- Detect power theft at the transformer level
- Detect illegal installations
- Provide information to customer service
- Immediate detection of the fault and location to send to the EPC.
- When used in feeders can provide ANTI-ISLAND detection
- Detect transformer overheating



2grid smilics CommPack GM4 - Dimensions



2grid smilics CommPack GM4- Technical Features

Electrical characteristics	
Power	10 VA
Input voltage	480/830 Vac
Frequency	50 – 60Hz
Voltage Input Range (PN)	0 – 480 Vac
Voltage Input Range (PP)	0 – 830 Vac
Current measurement range	0 - 4000 A
Current accuracy (primary/secondary)	± 1%
Voltage VLN	± 0.2%

Mechanical and physical characteristics	
Material	Plastic ABS | Flame resistant UL94 V0
Degree of protection	IP67
Installation	Neodymium magnet | DIN rail 35mm | Wall mount with 2 / 4 dowels (6 mm)
Temperature (Operation & Storage)*	-25ºC hasta +70ºC
Relative humidity	0% hasta 93%
Pressure	70 hasta 106 kPa
Maximum altitude	2000 m
Degree of pollution	PD2

Seguridad y EMC	
Installation Category	IV EB 61010-1
Input Voltage Safety Category	IEC 61010-1 CAT IV 600V
Current safety category and temperature sensor, 24 V input, Ethernet	IEC 61010-1 CAT IV 150V
Electromagnetic Compatibility	Emission: IEC 61000-6-4 Immunity: IEC 61000-6-2

Communications	
Type	LTE 4G-LTE CAT-1 Ethernet 10/100 Base TX
Connector	SMA external mobile antena RJ45 Shielded
Transmission Protocol	MODBUS TCP, MQTT, HTTP (Web/API), NTP, DCHP CLIENT

*According to standard IEC61557-12

2grid smilics CommPack GM4 - Technical Features

Cybersecurity

TPM 2.0 Cryptographic Hardware Accelerator

Secure firmware installation (SFI). Built-in security services to authenticate and protect software Intellectual Property while initial programming is being performed.

Cryptographic coprocessor with hardware-based secure key storage: Secure boot Secure firmware update (SBSFU).

Cryptographic functions: AES-128: Encrypt/Decrypt, Multiply in the Galois field for GCMn and HASH, SHA-1 and SHA-2 functions
(secure HASH algorithms), MD5, HMAC.

- Anti-tampering detection.
- Encrypted communications: HTTPS, MQTTS, MODBUS TCP TLS.

Test

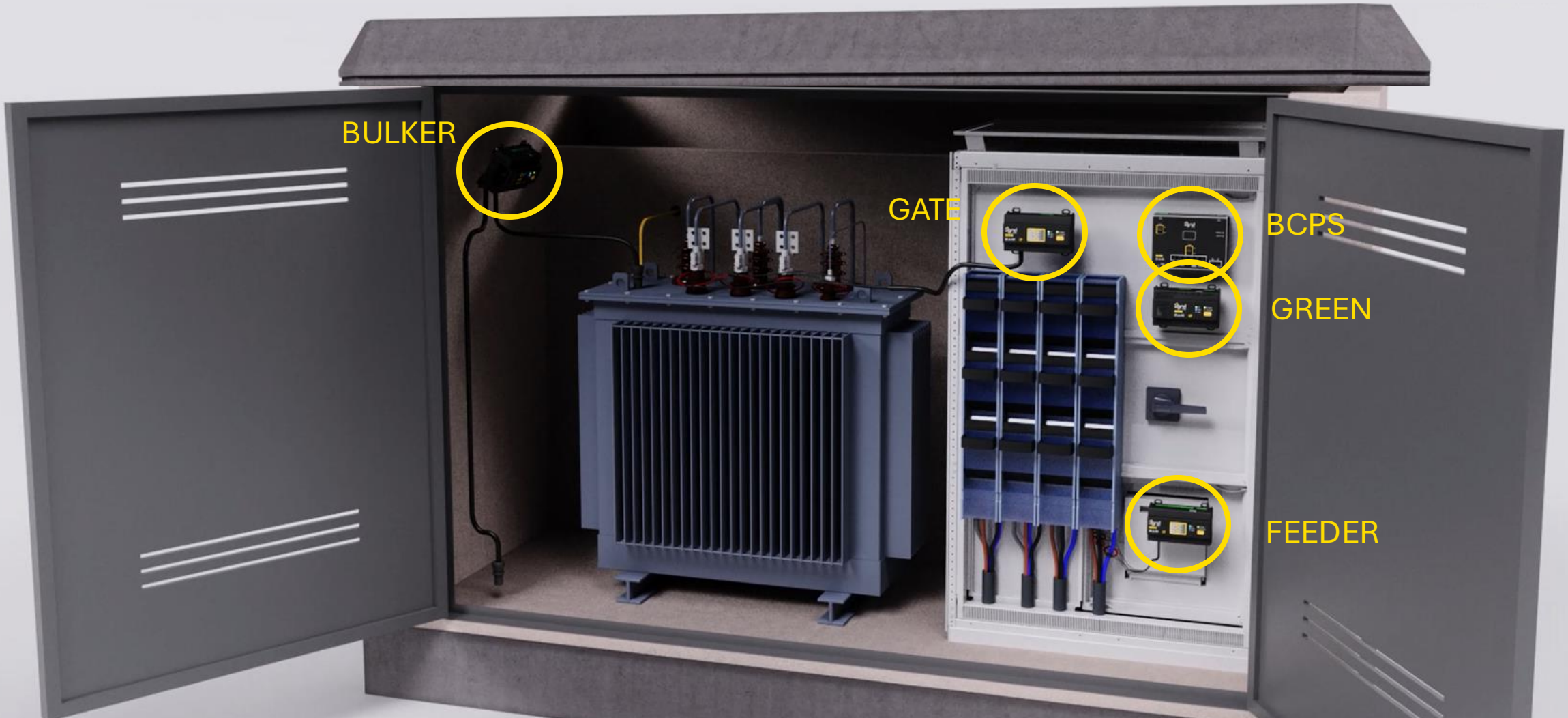
ESD (Electrostatic Discharge)	IEC EN 61000-4-2
Ring wave	IEC EN 61000-4-12
Damped oscillatory waves	IEC EN 61000-4-18
Fast Transients/Bursts	IEC EN 61000-4-4
Power Frequency Magnetic Field	IEC EN 61000-4-8
Radiated RF electromagnetic field	IEC EN 61000-4-3
Radiated RF electromagnetic field (digital radiotelephone)	IEC EN 61000-4-3
Test voltage level at main freq. conducted	IEC EN 61000-4-16
Conducted CM disturb. (0-150Hz)	IEC EN 61000-4-16
Conducted disturbances	IEC EN 61000-4-6

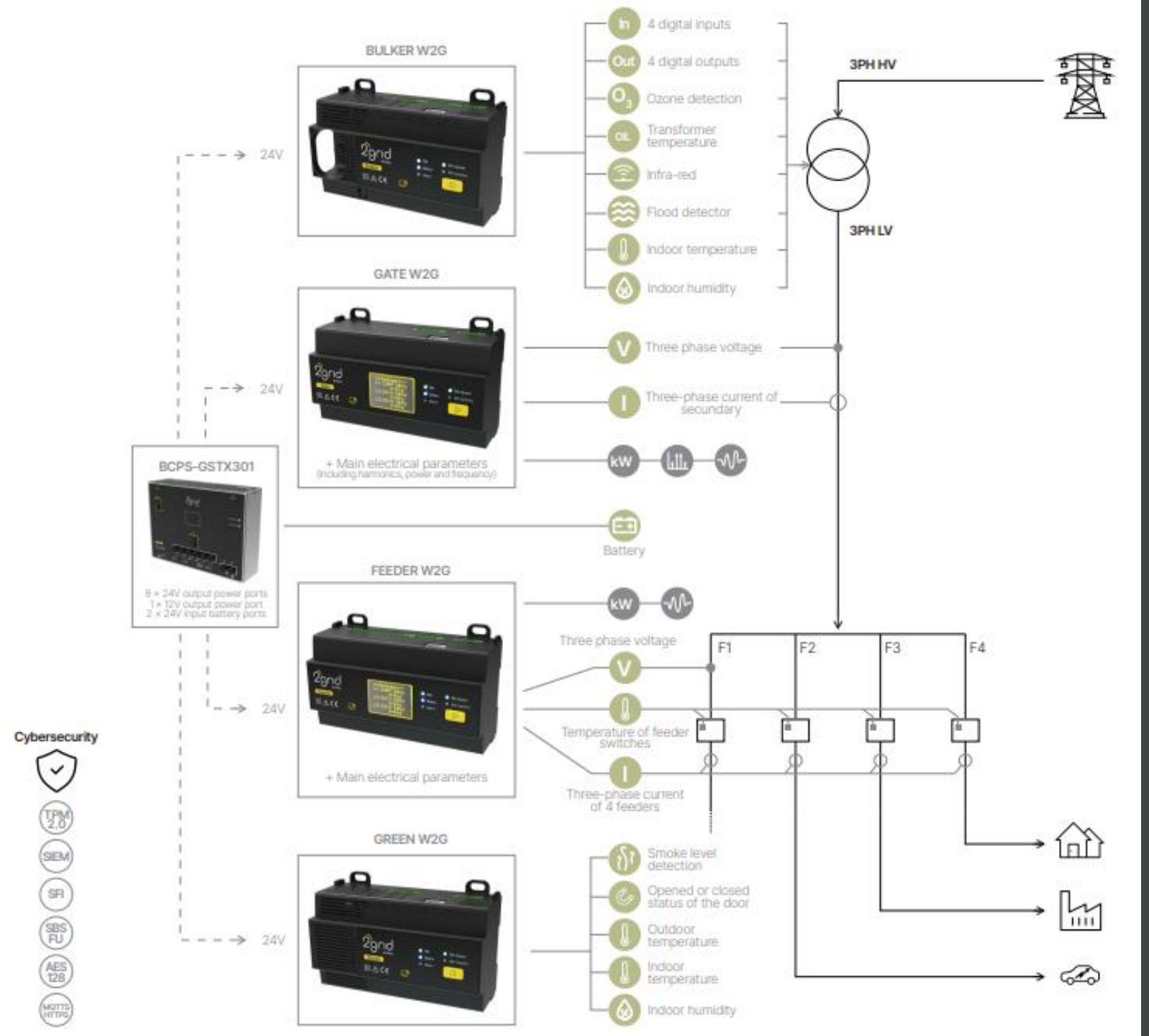
Datasheet
CommPack GM4

Modular Solutions

5 different equipment, for different monitoring needs.

Five devices, one substation





The 2grid System

Gate

2Grid® Gate is a power line monitoring system with real-time communications with the server. Its main functions are:

3PH+N
current measurement

Three-phase voltage measurement

Total harmonic distortion (THD). Calculation of voltage and current harmonics up to the 41st (21st odd harmonic).

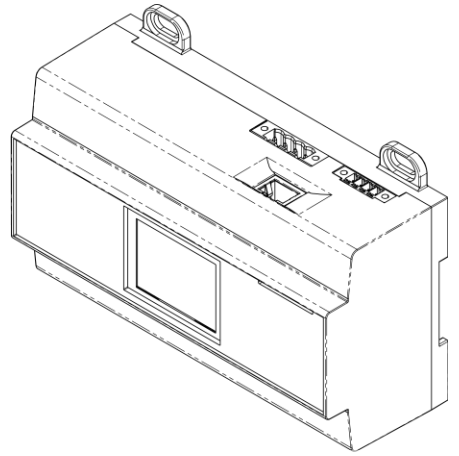
Calculation of derived electrical quantities Power, power factor cosΦ, active/reactive/apparent power, active energy per quadrant, symmetric components and frequency.

Measurement and recording of electrical parameters

Event log

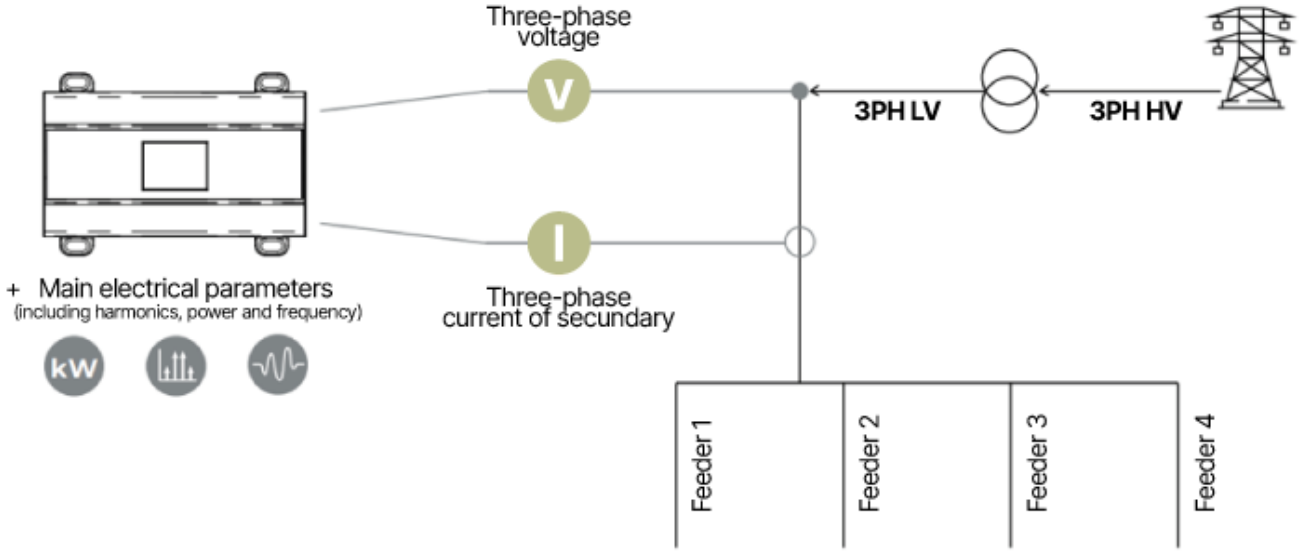
Alarms: short circuit, overload, power failure and switch temperature.

2grid Gate - Application

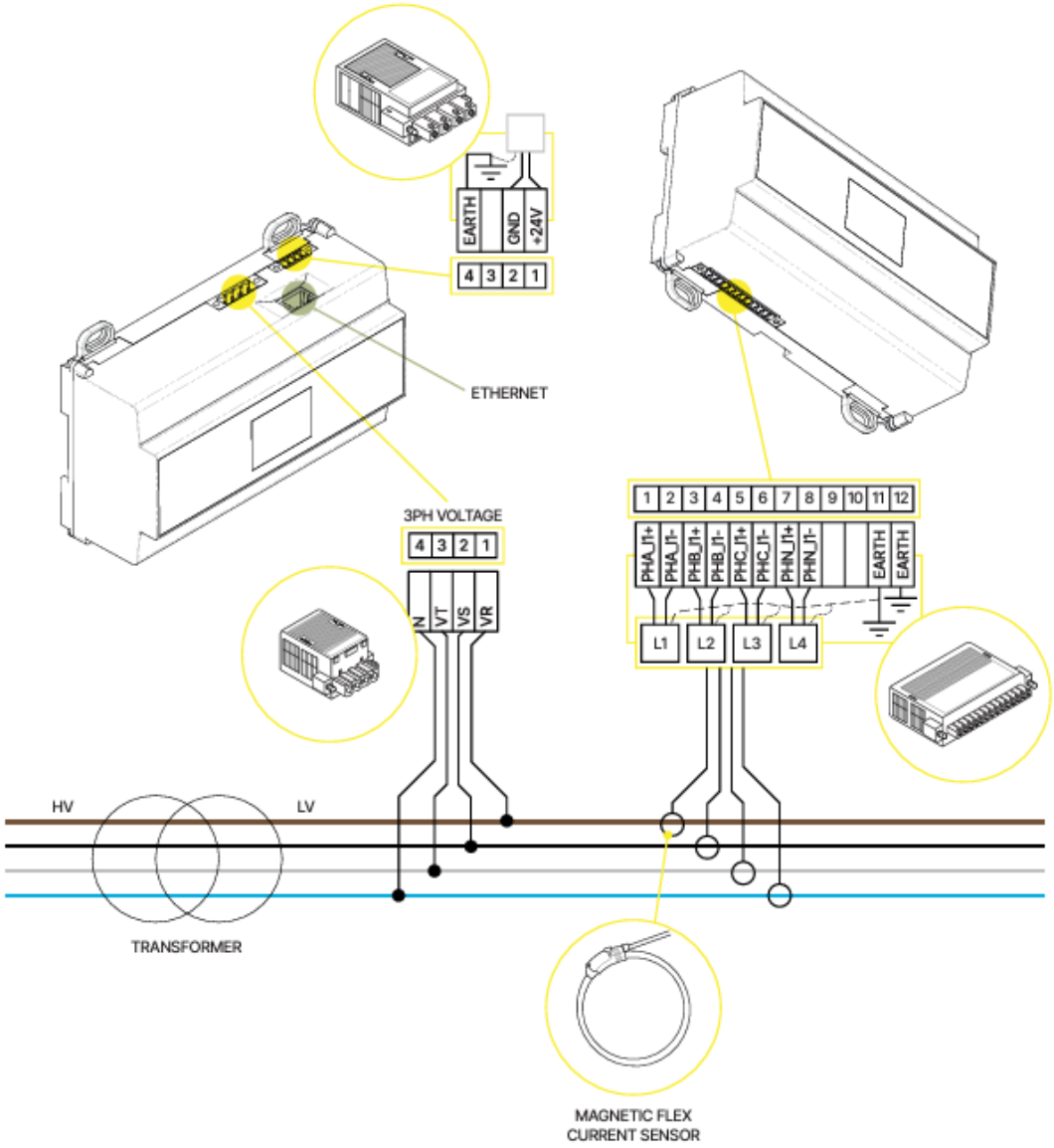


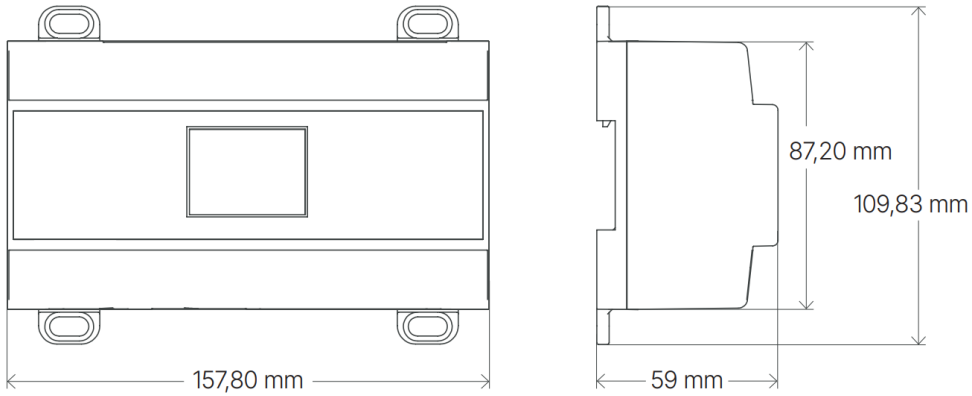
Use cases for the 2Grid® Gate:

- Detect transformer overload
- Measure the quality of the electrical supply
- Detect energy theft at the transformer level
- Detect illegal installations
- Provide information to customer service
- Immediate detection of the fault and location to send to the EPC.
- When used in feeders can provide ANTI-ISLAND detection



2grid smilics Gate - Connections and Dimensions





2grid Gate - Technical characteristics

Electrical characteristics	
Power supply	2,5 W
Input voltage	24V CC
Rated frequency	50 – 60Hz
Voltage input range	0 – 450 Vrms
Current measurement range	0 – 4000 A
Short circuit current measurement	10 - 4000 A
Current accuracy	± 0.2%
VLN Voltage accuracy	± 0.2%

Mechanical and physical characteristics	
Material	Plastic PA66 | Heat and flame resistant UL94 V0 / CTI ≥ 500
Protection rating	IP40
Installation	DIN rail 35mm | Wall mount with 2 / 4 dowels (6 mm)
Temperature (operating & storage)	-25ºC up to +70ºC
Relative humidity	0% up to 93%
Pressure	70 up to 106 kPa
Maximum altitude	2000 m
Pollution degree	PD3

Safety and EMC	
Installation Category	IV EB 61010-1
Safety category voltage measurement inputs	IEC 61010-1 CAT IV 300V
Safety category current & temperature sensor, 24 V input, Ethernet	IEC 61010-1 CAT IV 150V
Electromagnetic compatibility	Emission: IEC 61000-6-4 Immunity: IEC 61000-6-2

Communications	
Type	Ethernet 10/100 Base TX
Connector	RJ45 Blindado
Communication Protocols	Modbus TCP, MQTT, Web, Server, NTP, DCHP Client, Rest API, Sys Log

2grid Gate - Technical characteristics

Cybesecurity

TPM 2.0 Cryptographic hardware accelerator

Secure Firmware Install (SFI). Embedded security services to authenticate and protect the software IPs while performing initial programming.

Cryptographic Co-processor with Secure Hardware-based Key Storage: Secure Boot Secure Firmware Update (SBSFU).

Cryptographic functions: AES-128: Encrypt/Decrypt, Galois Field Multiply for GCMn and HASH functions, SHA-1 and SHA-2 (secure HASH algorithms), MD5, HMAC.

Antitamper detection.

Encrypted communications: HTTPS, MQTTS, MODBUS TCP TLS.

Test	
ESD	IEC EN 61000-4-2
Ring Wave	IEC EN 61000-4-12
Damped oscillatory waves	IEC EN 61000-4-18
Fast transient / burst	IEC EN 61000-4-4
Power frequency magnetic field	IEC EN 61000-4-8
Radiated RF EM field	IEC EN 61000-4-3
Radiated RF EM field (digital radio teleph.)	IEC EN 61000-4-3
Test voltage level at main freq. conducted	IEC EN 61000-4-16
Conducted CM disturb. (0-150Hz)	IEC EN 61000-4-16
Conducted disturbances	IEC EN 61000-4-6

Datasheet Gate

Feeder

2Grid® Feeder is a power line monitoring system with real-time communications with the server. Its main functions are:

Current measurement of 4 feeders (16 current sensors)

Three-phase voltage measurement

Feeder temperature measurement (up to 4 measurement tests)

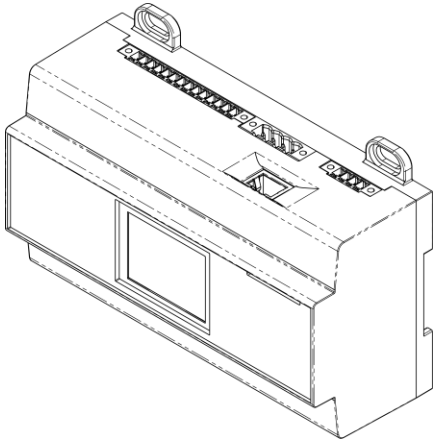
Calculation of derived electrical quantities Power, power factor cosΦ, active/reactive/apparent power, active energy per quadrant, symmetric components and frequency.

Measurement and recording of electrical parameters

Event log

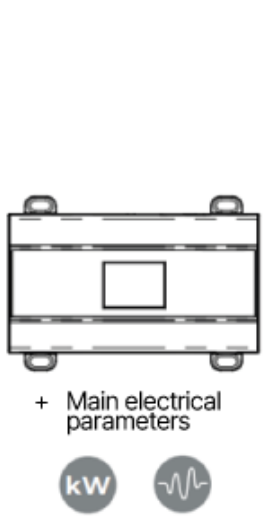
Alarms: short circuit, overload, power failure and switch temperature.

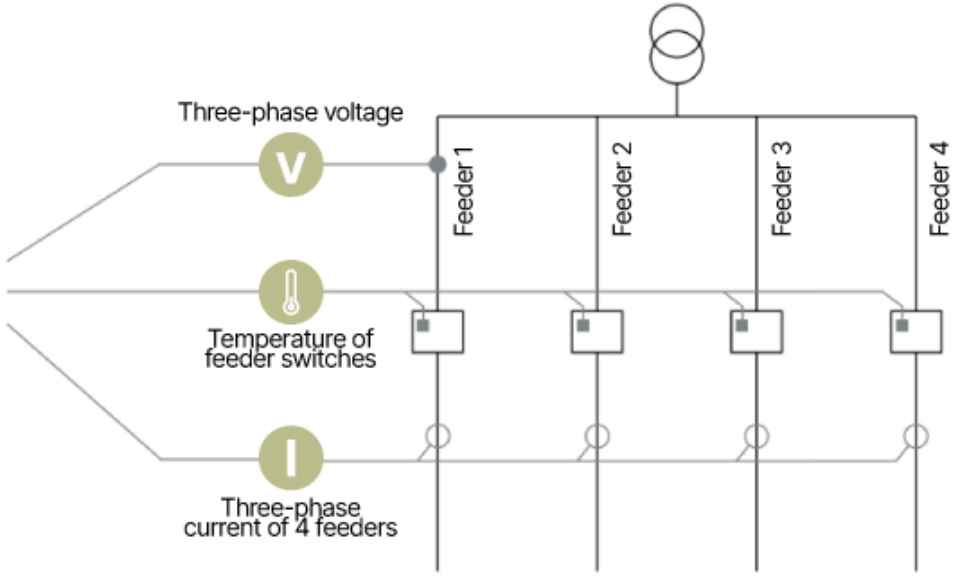
2grid Feeder - Application



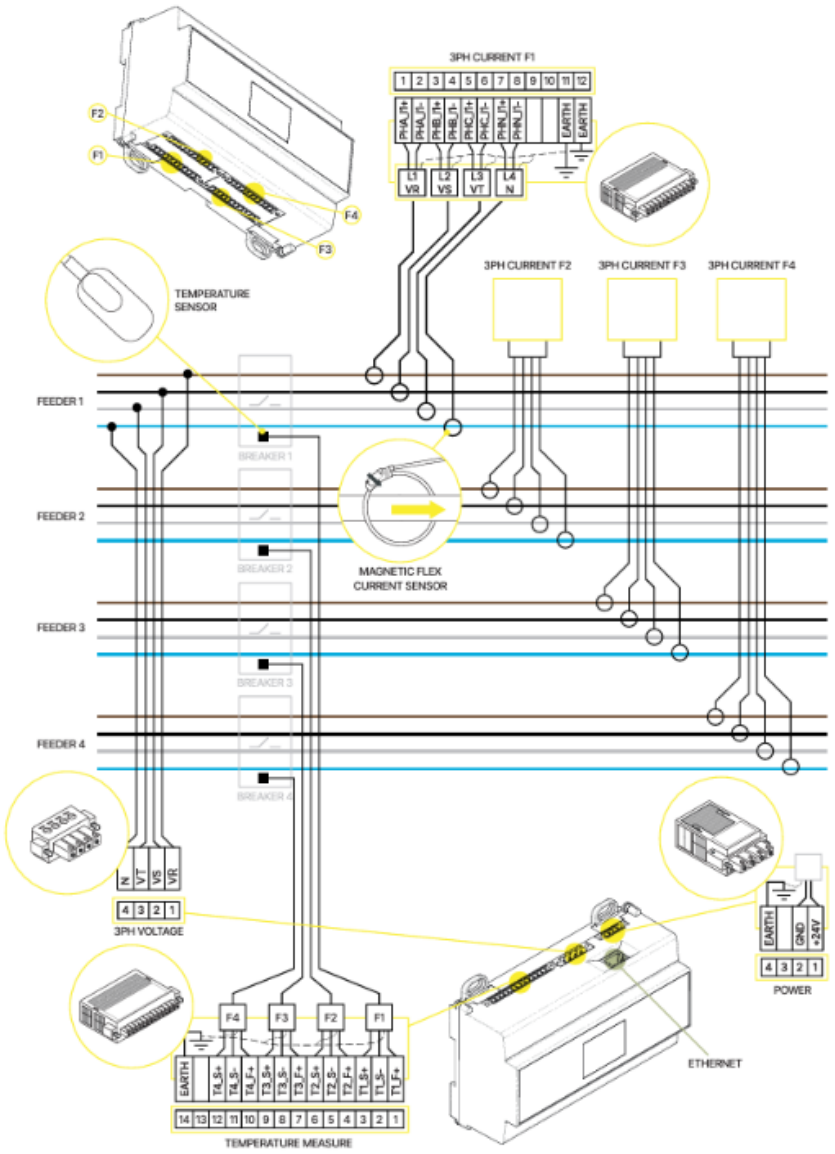
Use cases for the 2Grid® Feeder:

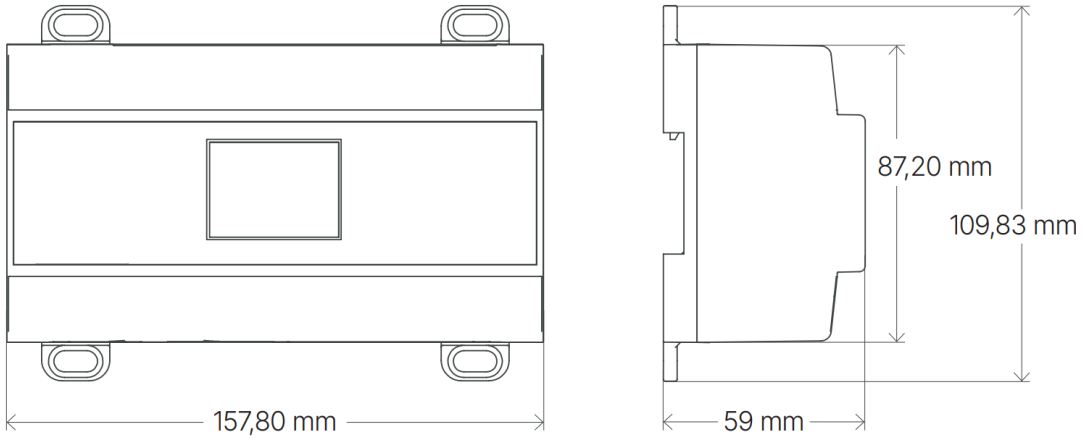
- Detection of a feeder overload.
- Measurement of the output voltage level of the tap changer.
- Cable overheating.
- Detect blown fuses.
- Detection of imbalances between phases.
- Reverse power detection.
- Detection of energy theft in feeders.
- Detect illegal installations.
- Provide information to customer service.
- Immediate detection of the fault and location to send to the EPC.





2grid smilics Feeder - Connections and Dimensions





2grid smilics Feeder - Technical characteristics

Electrical characteristics	
Power supply	2,5 W
Input voltage	24V CC
Rated frequency	50 – 60Hz
Voltage input range	0 – 450 Vrms
Current measurement range	0 – 4000 A
Short circuit current measurement	10 - 4000 A
Current accuracy	± 0.2%
VLN Voltage accuracy	± 0.2%

Mechanical and physical characteristics	
Material	Plastic PA66 | Heat and flame resistant UL94 V0 / CTI ≥ 500
Protection rating	IP40
Installation	DIN rail 35mm | Wall mount with 2 / 4 dowels (6 mm)
Temperature (operating & storage)	-25ºC up to +70ºC
Relative humidity	0% up to 93%
Pressure	70 up to 106 kPa
Maximum altitude	2000 m
Pollution degree	PD3

Safety and EMC	
Installation Category	IV EB 61010-1
Safety category voltage measurement inputs	IEC 61010-1 CAT IV 300V
Safety category current & temperature sensor, 24 V input, Ethernet	IEC 61010-1 CAT IV 150V
Electromagnetic compatibility	Emission: IEC 61000-6-4 Immunity: IEC 61000-6-2

Communications	
Type	Ethernet 10/100 Base TX
Connector	RJ45 Blindado
Communication Protocols	Modbus TCP, MQTT, Web, Server, NTP, DCHP Client, Rest API, Sys Log

2grid smilics Feeder - Technical characteristics

Cybesecurity

TPM 2.0 Cryptographic hardware accelerator

Secure Firmware Install (SFI). Embedded security services to authenticate and protect the software IPs while performing initial programming.

Cryptographic Co-processor with Secure Hardware-based Key Storage: Secure Boot Secure Firmware Update (SBSFU).

Cryptographic functions: AES-128: Encrypt/Decrypt, Galois Field Multiply for GCMn and HASH functions, SHA-1 and SHA-2 (secure HASH algorithms), MD5, HMAC.

Antitamper detection.

Encrypted communications: HTTPS, MQTTS, MODBUS TCP TLS.

Test

ESD	IEC EN 61000-4-2
Ring Wave	IEC EN 61000-4-12
Damped oscillatory waves	IEC EN 61000-4-18
Fast transient / burst	IEC EN 61000-4-4
Power frequency magnetic field	IEC EN 61000-4-8
Radiated RF EM field	IEC EN 61000-4-3
Radiated RF EM field (digital radio teleph.)	IEC EN 61000-4-3
Test voltage level at main freq. conducted	IEC EN 61000-4-16
Conducted CM disturb. (0-150Hz)	IEC EN 61000-4-16
Conducted disturbances	IEC EN 61000-4-6

Datasheet Feeder

Bulker

2Grid® Bulker measures the inside of the MV-to-LV power distribution transformer. Its main functions are:

- Compatible con cualquier tipo de transformador
- Medición de la temperatura del aceite del transformador
- Medición por infrarrojo de la temperatura del chasis del transformador
- Registro cronológico de alarmas y eventos de la subestación
- Comprobación de inundación del CT
- Medición del nivel de ozono
- 8 entradas y salidas digitales configurables
- Medición de la temperatura y humedad ambiental interior

By using the configurable digital inputs and outputs, you can:

- Configure the activation and deactivation of forced ventilation based on transformer temperatures. • Monitoring the statusof MV switches.
- Monitoring of fault circuit indicators (FCI) always in combination with 24Vdc power supply with last gasp.
- Monitor battery status

Bulker

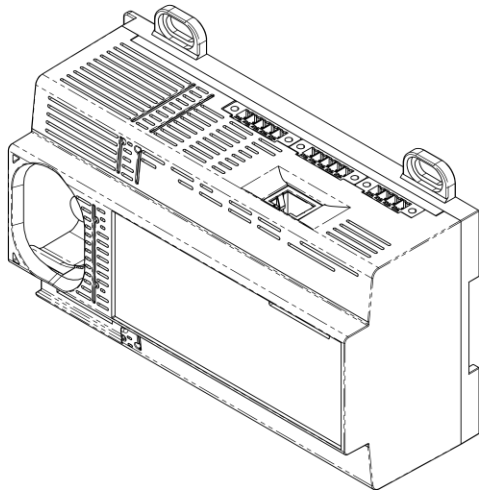
2Grid® Bulker measures the inside of the MV-to-LV power distribution transformer. Its main functions are:

- Compatible with any type of transformer
- Transformer Oil Temperature Measurement
- Infrared measurement of transformer chassis temperature
- Chronological recording of substation alarms and events
- CT Flood Check
- Ozone level measurement
- 8 configurable digital inputs and outputs
- Measurement of indoor ambient temperature and humidity

By using the configurable digital inputs and outputs, you can:

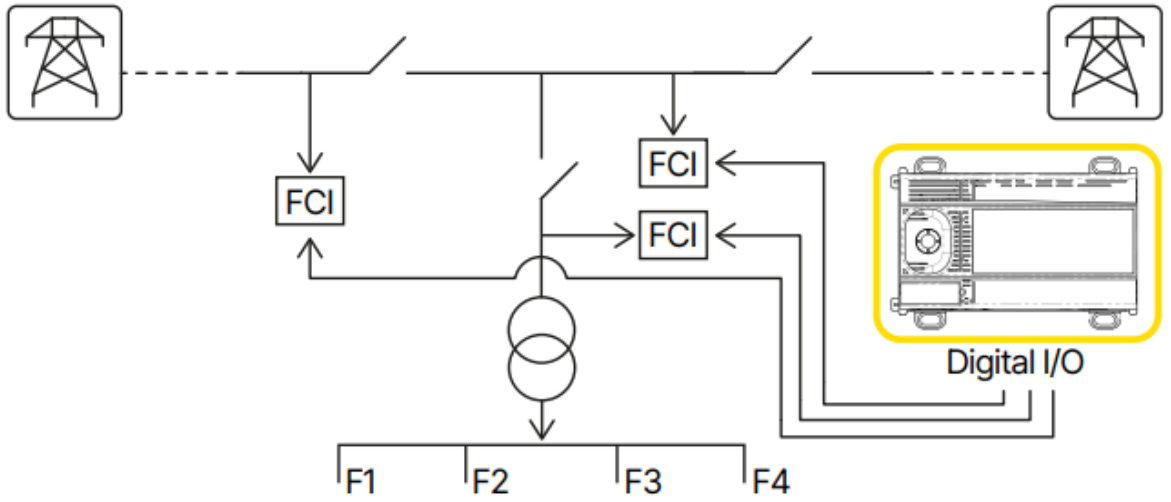
- Configure the activation and deactivation of forced ventilation based on transformer temperatures.
- Monitoring the status of MV switches.
- Monitoring of fault circuit indicators (FCI) always in combination with 24Vdc power supply with last gasp.
- Monitor battery status

2grid smilics Bulker - Application

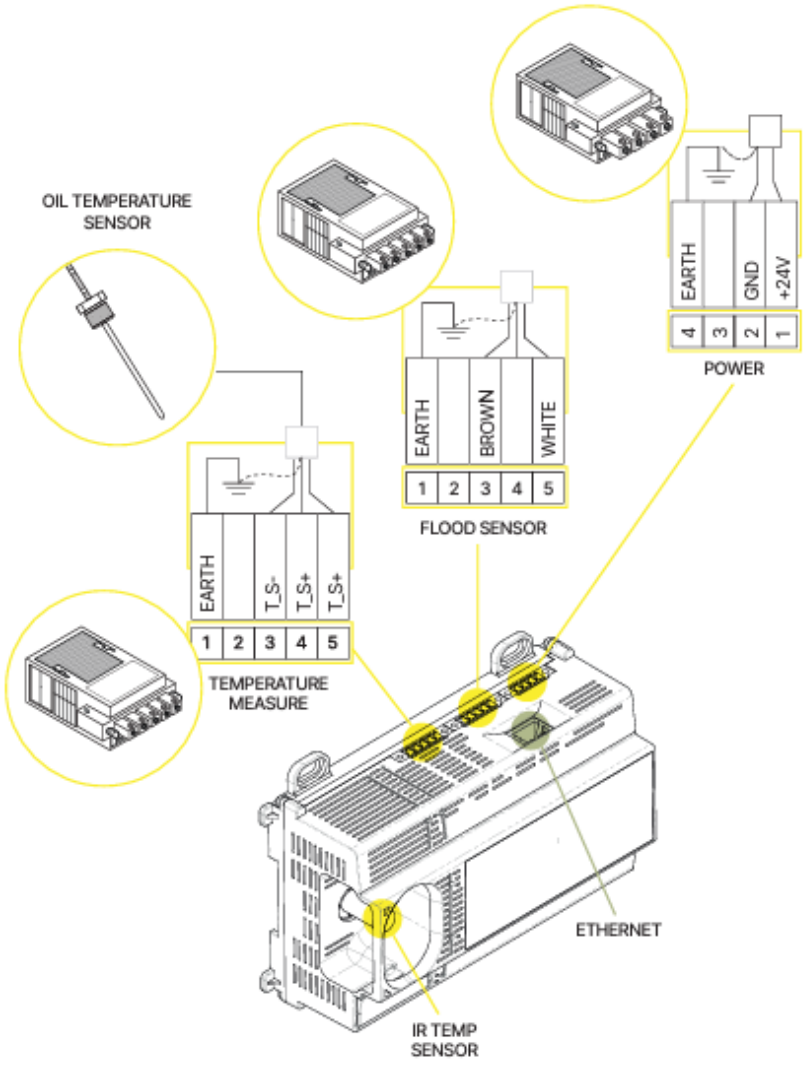


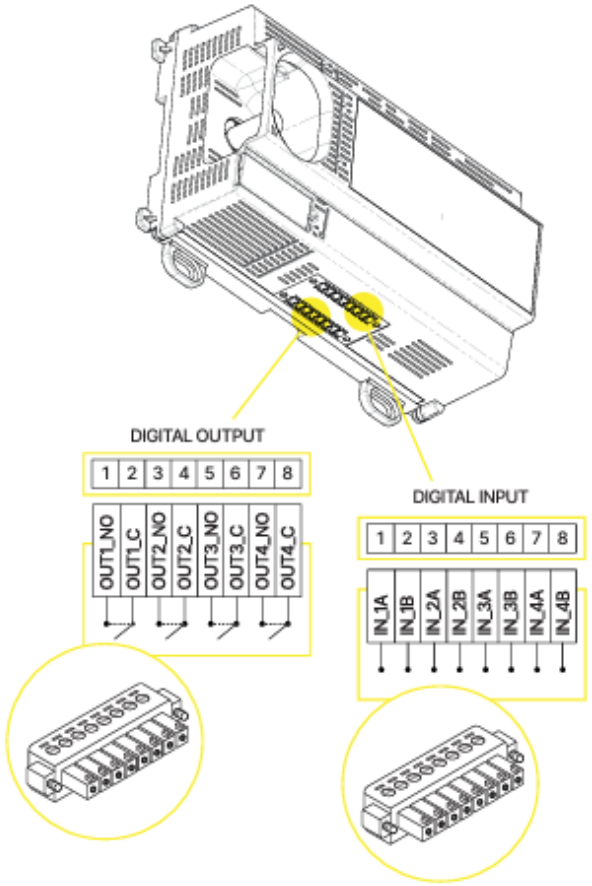
2Grid® Bulker Use Cases:

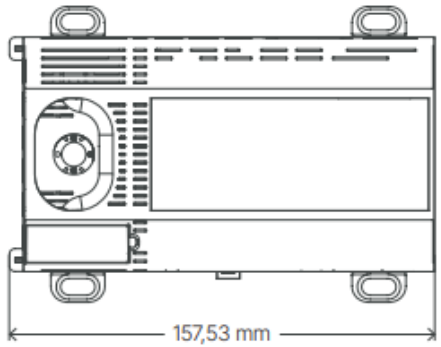
- Electric arcs cause the air to ionize and O2 is converted into O3. Thanks to ozone sensors, we will be able to prevent major problems.
- Detection of water inside secondary substations.
- Detect overheating in the transformer.
- Oil temperature measurement.
- Measurement of indoor ambient temperature and humidity to see if heat is being evacuated in the secondary substation.
- Enable/disable forced ventilation instead of having it running all the time.
- 4 digital inputs and 4 digital outputs to measure any type of useful information for the power company such as: battery status, FCI status, MV switch status, etc.
- Prepared for rural or urban secondary substations

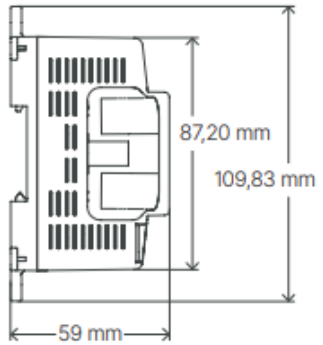


2grid smilics Bulker - Connections & Dimensions









2grid smilics Bulker - Technical characteristics

Electrical Characteristics	
Power supply	2,5 W
Input Voltage	24V CC
Mechanical and Physical Characteristics	
Material	Plastic PA66 | Heat and flame resistant UL94 V0 / CTI ≥ 500
Degree of protection	IP40
Installation	Wall mount with 2 dowels (6 mm)
Temperature (operating and storage)	-25ºC up to +70ºC
Relative humidity	0% up to 93%
Pressure	70 up to 106 kPa
Maximum Altitude	2000 m
Degree of pollution	PD3

Security & EMC	
Installation Category	IV EB 61010-1
Input Voltage Safety Category	IEC 61010-1 CAT IV 300V
Current Safety Category & Temperature Sensor, 24 V Input, Ethernet	IEC 61010-1 CAT IV 150V
Electromagnetic compatibility	Emission: IEC 61000-6-4 Immunity: IEC 61000-6-2
Communications	
Type	Ethernet 10/100 Base TX
Connector	RJ45 Blindado
Transmission Protocol	Modbus TCP, MQTT, Web, Server, NTP, DCHP Client, Rest API, Sys Log

Sensors*
Oil temperature
Infrared Temperature
Indoor Temperature
Indoor humidity
Floods
Ozone

*Consult the data sheet for more detailed information

2grid smilics Bulker - Technical characteristics

Cybersecurity

TPM 2.0 Cryptographic Hardware Accelerator

Secure Firmware Installation (SFI). Built-in security services to authenticate and protect software Intellectual Properties while performing initial programming.

Cryptographic Coprocessor with Hardware-Based Secure Key Storage: Secure Boot Secure Firmware Update (SBSFU).

Cryptographic functions: AES-128: Encrypt/Decrypt, Multiply in Galois Field for GCMn and HASH functions, SHA-1 and SHA-2 (secure HASH algorithms), MD5, HMAC.

- Anti-tamper detection.
- Encrypted communications: HTTPS, MQTTS, MODBUS, TCP, TLS.

Test

ESD (Electrostatic Discharge)	IEC EN 61000-4-2
Ring wave	IEC EN 61000-4-12
Damped oscillatory waves	IEC EN 61000-4-18
Fast Transients/Bursts	IEC EN 61000-4-4
Power Frequency Magnetic Field	IEC EN 61000-4-8
Radiated RF electromagnetic field	IEC EN 61000-4-3
Radiated RF EM field (digital radio teleph.)	IEC EN 61000-4-3
Test voltage level at main freq. conducted	IEC EN 61000-4-16
Driven CM Disturbances (0-150Hz)	IEC EN 61000-4-16
Conducted Disturbances	IEC EN 61000-4-6

Datasheet Bulker

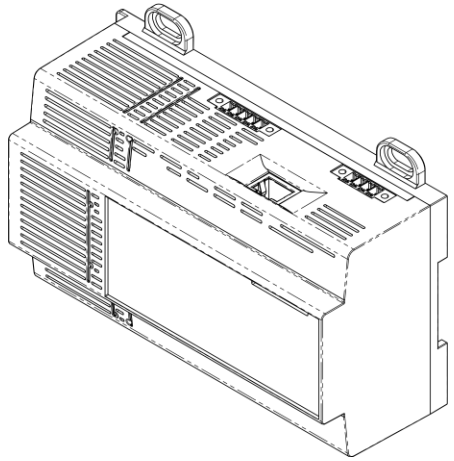
Green

Substation environmental control system.

2Grid® Green is a substation environmental monitoring device. Its main functions are:

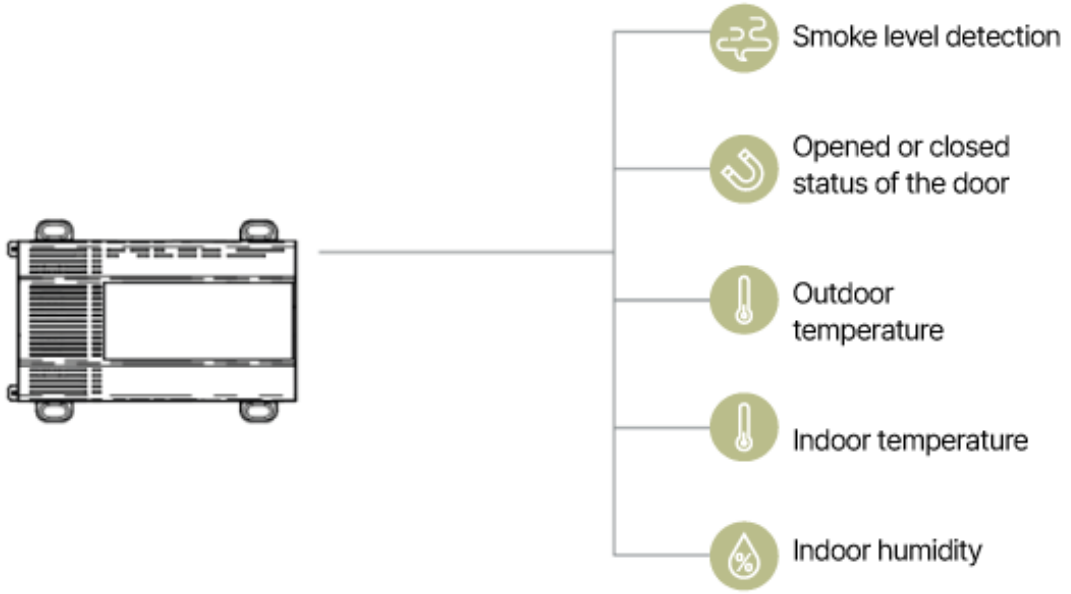
- Outdoor and indoor temperature measurement
- Indoor Humidity Measurement
- Substation Door Opening Status
- Dark Smoke Level Monitor
- Chronological recording of substation alarms and events
- Indoor Ambient Temperature and RH Measurement

2grid Green - Application

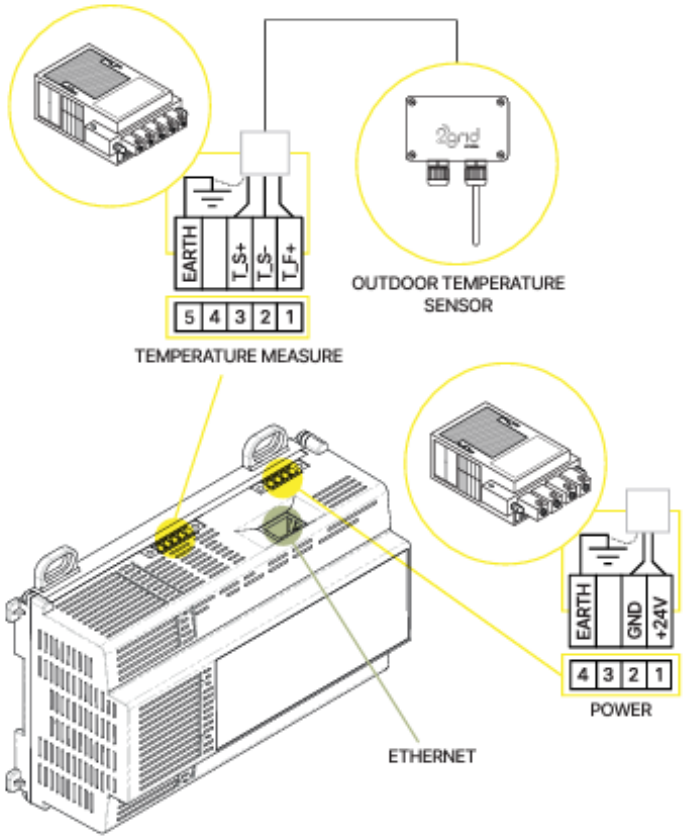


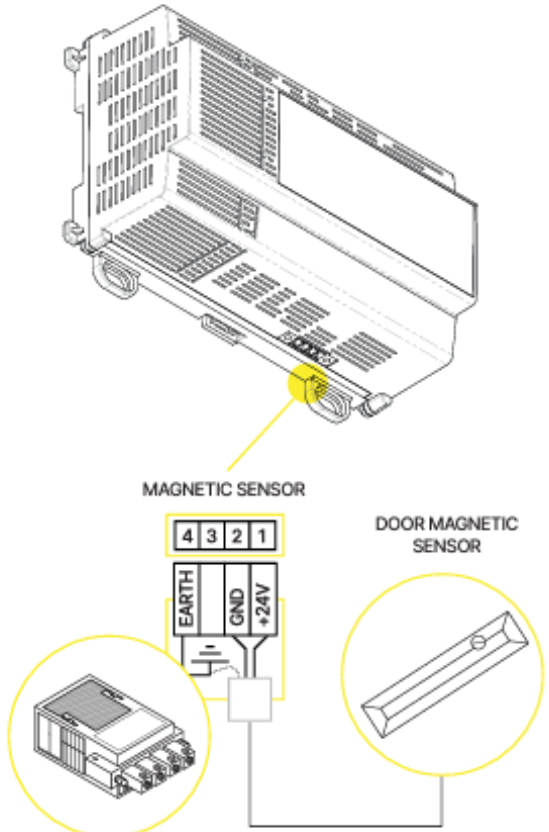
2Grid® Green Use Cases:

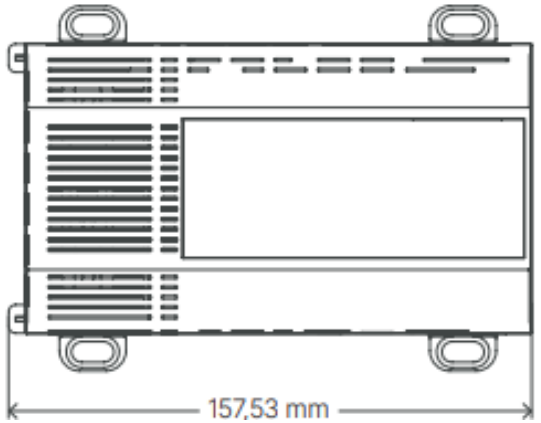
- Compare the outside and inside temperature to see if we are evacuating heat well.
- Enabling/disabling forced ventilation.
- Detect intrusion, possible copper theft, etc.
- Detect a fire.
- Prepared for rural or urban secondary substations.
- Vibration & Sound Suggestion

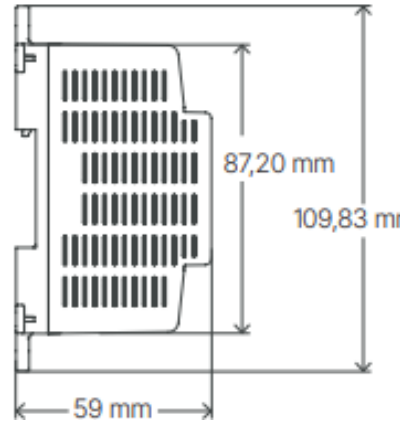


2grid Green - Connections & Dimensions









2grid Green - Technical characteristics

Electrical Characteristics	
Power supply	2,5 W
Input Voltage	24V CC

Mechanical and Physical Characteristics	
Material	Plastic PA66 | Heat and flame resistant UL94 V0 / CTI ≥ 500
Degree of protection	IP40
Installation	Wall mount with 2 dowels (6 mm)
Temperature (operating and storage)	-25ºC hasta +70ºC
Relative humidity	0% up to 93%
Pressure	70 up to 106 kPa
Maximum Altitude	2000 m
Degree of pollution	PD3

Security & EMC	
Installation Category	IV EB 61010-1
Input Voltage Safety Category	IEC 61010-1 CAT IV 300V
Current Safety Category & Temperature Sensor, 24 V Input, Ethernet	IEC 61010-1 CAT IV 150V
Electromagnetic compatibility	Emission: IEC 61000-6-4 Immunity: IEC 61000-6-2

Communications	
Type	Ethernet 10/100 Base TX
Connector	RJ45 Blindado
Transmission Protocol	Modbus TCP, MQTT, Web, Server, NTP, DCHP Client, Rest API, Sys Log

Sensors*
Dark Smoke
Outdoor Temperature Probe
Contacto magnético de puerta
Indoor Temperature

*Consult the data sheet for more detailed information

2grid Green - Technical characteristics

Cybersecurity

TPM 2.0 Cryptographic hardware accelerator

Secure Firmware Install (SFI). Embedded security services to authenticate and protect the software IPs while performing initial programming.

Cryptographic Co-processor with Secure Hardware-based Key Storage: Secure Boot Secure Firmware Update (SBSFU).

Cryptographic functions: AES-128: Encrypt/Decrypt, Galois Field Multiply for GCMn And HASH functions, SHA-1 and SHA-2 (secure HASH algorithms), MD5, HMAC.

- Antitamper detection.
- Encrypted communications: HTTPS, MQTTS, MODBUS TCP TLS.

Test

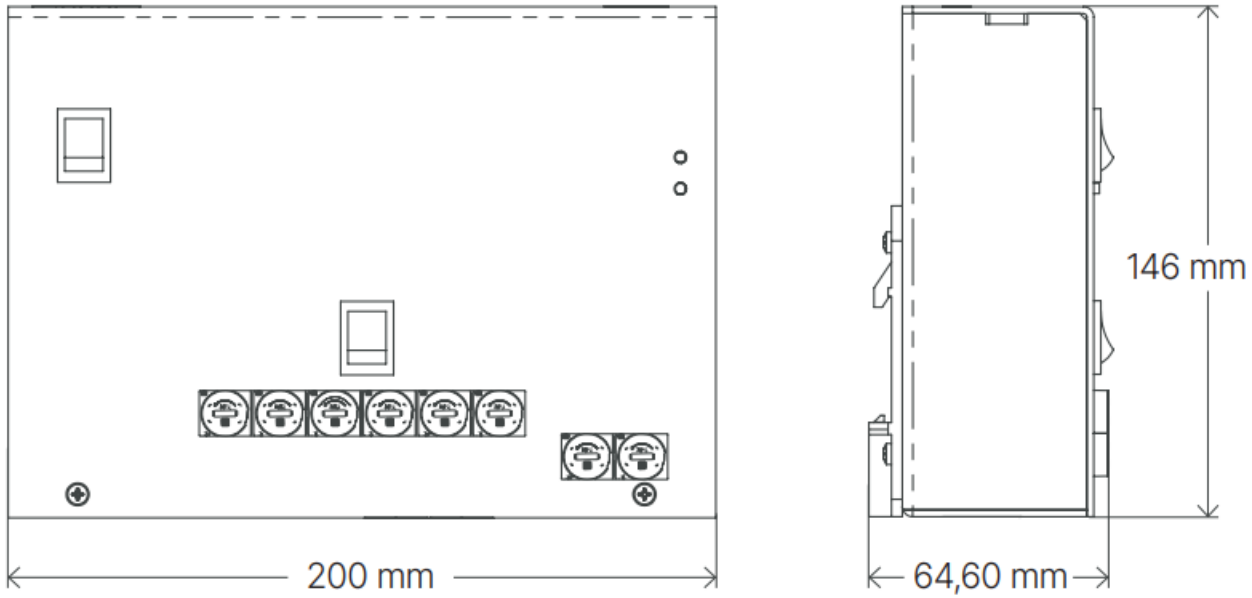
ESD (Electrostatic Discharge)	IEC EN 61000-4-2
Ring wave	IEC EN 61000-4-12
Damped oscillatory waves	IEC EN 61000-4-18
Fast Transients/Bursts	IEC EN 61000-4-4
Power Frequency Magnetic Field	IEC EN 61000-4-8
Radiated RF electromagnetic field	IEC EN 61000-4-3
Radiated RF EM field (digital radio teleph.)	IEC EN 61000-4-3
Test voltage level at main freq. conducted	IEC EN 61000-4-16
Driven CM Disturbances (0-150Hz)	IEC EN 61000-4-16
Conducted Disturbances	IEC EN 61000-4-6

Datasheet Green

BCPS

2Grid® BCPS is an advanced power battery charger for digital substation, capable of powering devices intended for remote control and protection of the MV and LV network in secondary substation, as well as devices used to collect information from environmental sensors and advanced electrical and related sensors.

2grid smilics BCPS - Dimensions



2grid smilics BCPS - Technical characteristics

Input Features	
AC Input Voltage	Universal
Minimum AC Input Voltage	85Vac
Maximum AC Input Voltage	253Vac
AC Input Frequency Range	47…63Hz
Current Measurement Range	0 – 4000 A
Maximum Input Current	5A

Output Characteristics	1	2
Output Type	DC	DC
Output Voltage	27,4V	12V
Voltage tolerance	±1%	±1%
Maximum Continuous Current (Io)	4A	0,7A

Mechanical and Physical Characteristics	
Input Connection Type	Removable Terminal Blocks (Pitch ≥5.08mm)
Output Connection Type	Removable Terminal Blocks (Pitch ≥3.81mm)
Storage Temperature	-25ºC up to +70ºC
Operating Temperature	-10ºC up to +60ºC
Refrigeration	Natural convection
Relative humidity	5% up to 93%
Maximum Altitude	2000 m
Climatic Testing	IEC60068-2-1, IEC60068-2-14, IEC60068-2-2, IEC60068-2-78
Vibration	EN60068-2-6, EN60068-2-64
Environmental regulations	RoHs according to directive 2015/863/EU and REACH

Security & EMF	
Safety according to the standard	EN 60255-27
Degree of pollution	PD2
Overload Category	OV4
Degree of protection	IP20

Cybersecurity Compliance

Secure boot

Bootloader: Installed in a secure area and neither readable nor modifyable

Application: Only a properly signed application is executed by the bootloader

Secure FW update

Only properly authenticated applications can be installed.

Secure storage

Criptographic chipset for the storage of keys and passwords.

Certification FIPS 140-2 L2 (L3 at physical level), TPM 2.0 EAL4+ and HW EAL5+

Secure communications

Encrypted communications TLS (HTTPs, MQTTs)

Reverse engineering

Encrypted application to prevent reverse engineering

Antitamper

Tamper detection on the case of all 2Grid devices, even without power.

Besides the alarm, it can also execute an event like deleting all memory.

Hidden tracks on the circuit board

Hidden pins on the circuit board

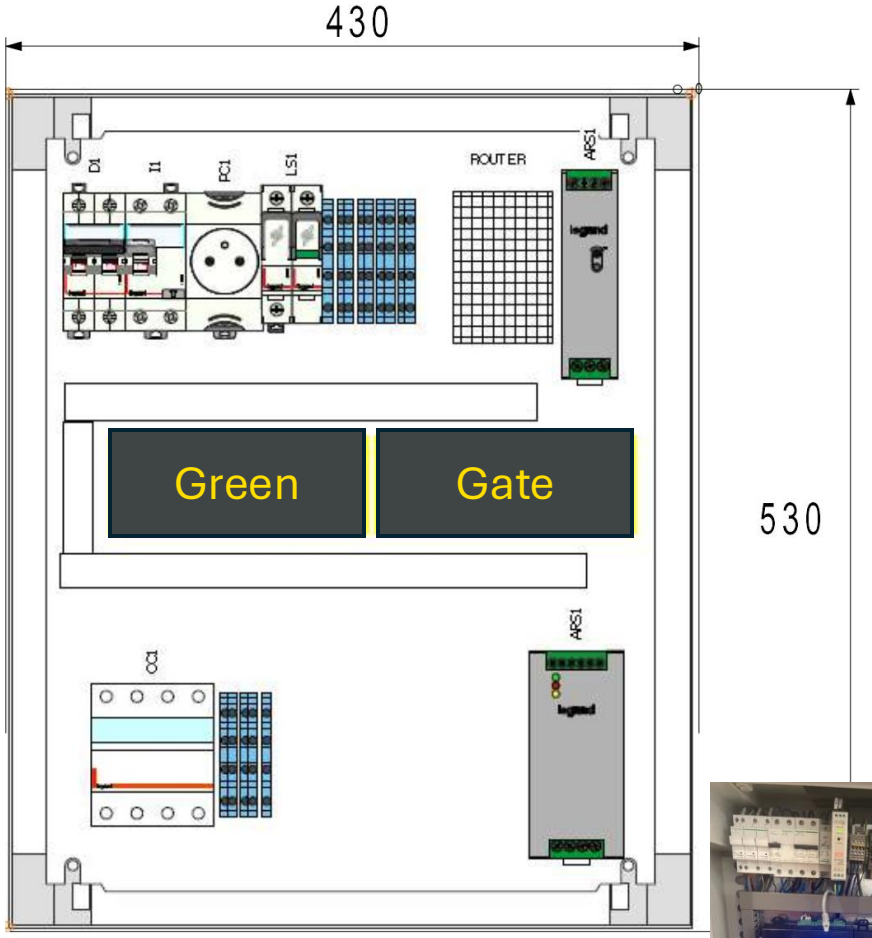
Delete printing on the most significant chipsets so that they cannot be identified.

We even burn the test port once manufactured so that it is not accesible anymore

Cabinets Solutions

Ready to plug, ready to use

2grid Gate & Green Solution



IP66 polyester enclosure with dimensions of 530x430x220 that includes:

- 24Vdc power supply capable of lasting up to 30s in the absence of power and warning of lack of supply
- 4G router router with 24Vdc power
- Fuses
- Surge Protector
- MCB
- RCD
- 2Grid GATE
- 2Grid GREEN
- DIN rail socket to connect computer (optional, not included)
- Terminals for voltage inputs

2GRID GREEN

Equipment for measuring the condition of the power transformer that includes all of the following sensors:

- Sensor for cabinet opening detection
- Smoke Sensor
- Temperature Measurement
- Humidity measurement
- Transformer Oil Temperature Measurement / Transformer Chassis Measurement

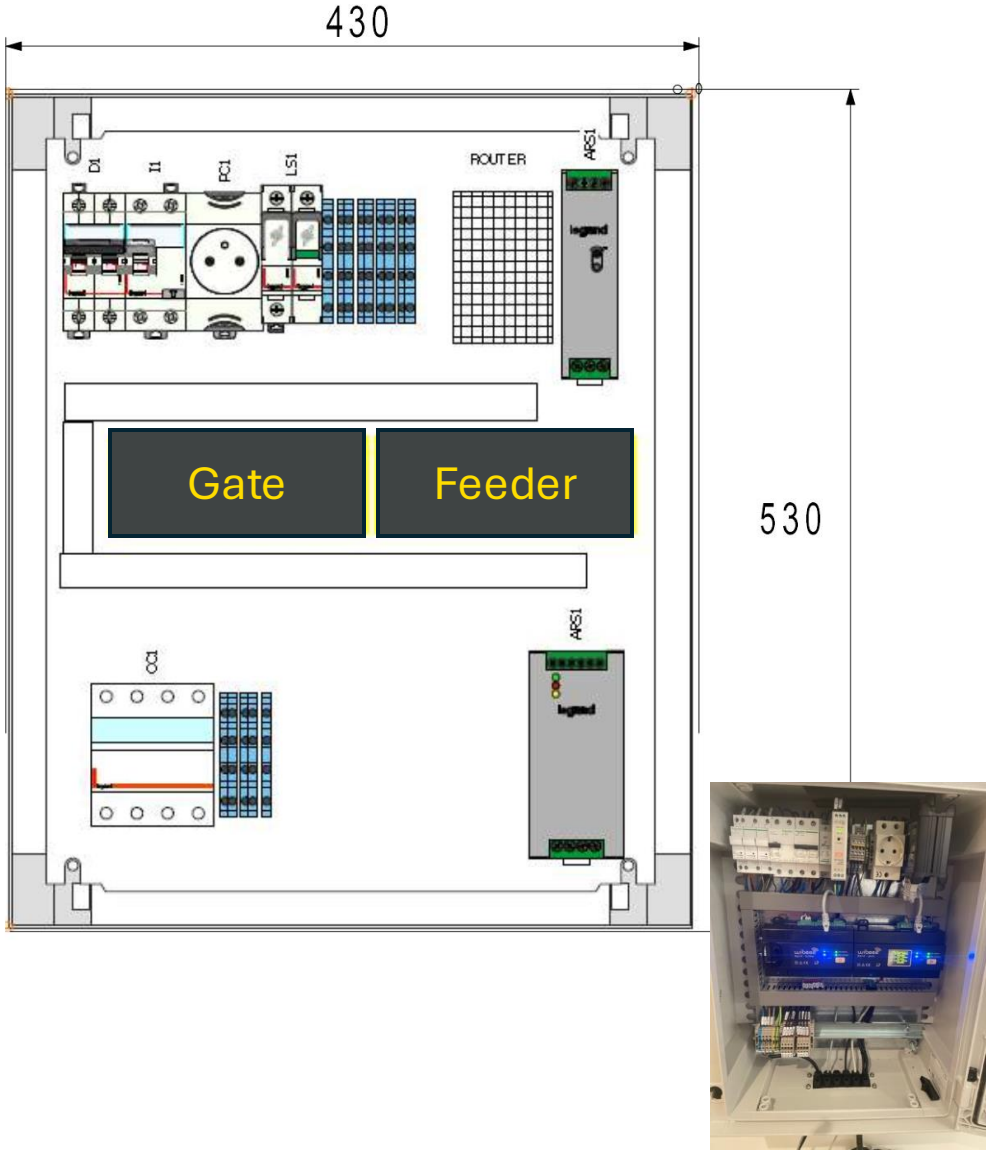
2GRID GATE

Equipment for measuring all electrical parameters in the transformer secondary, as well as individual harmonics in V and A.

All 2GRID devices have the highest level of cybersecurity, detection, lifting, data erasure, cryptographic chip, no backdoor, hidden tracks, ...

The devices communicate with either Modbus or MQTT.

2grid smilics Gate & Feeder Solution



IP66 polyester enclosure with dimensions of 530x430x220 that includes:

- 24Vdc power supply capable of lasting up to 30s in the absence of power and warning of lack of supply
- 4G router router with 24Vdc power
- Fuses
- Surge Protector
- MCB
- RCD
- 2Grid GATE
- 2Grid FEEDER
- DIN rail socket to connect computer (optional, not included)
- Terminals for voltage inputs

2GRID GATE

Equipment for measuring all electrical parameters in the transformer secondary, as well as individual harmonics in V and A. The equipment includes the power cable, voltage measurement cables, Ethernet connector as well as current sensors of the 3F+N

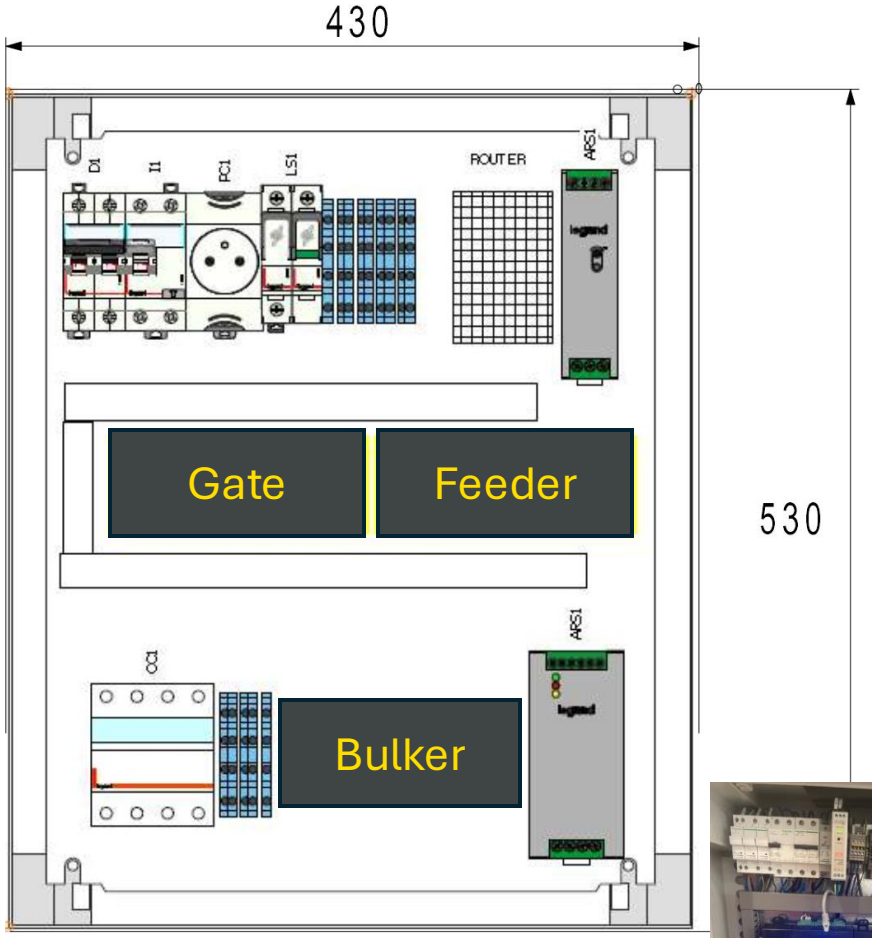
2GRID FEEDER

Equipment for measuring all electrical parameters of the 3F+N of the 4 output lines. The equipment includes the power cable, the voltage measurement cables, the Ethernet connector as well as the current sensors of the 3F+N of the 4 lines

All 2GRID devices have the highest level of cybersecurity, detection, lifting, data erasure, cryptographic chip, no backdoor, hidden tracks, …

The devices communicate with either Modbus or MQTT.

2grid smilics Gate , Feeder & Bulker Solution



IP66 polyester enclosure with dimensions of 530x430x220 that includes:

- 24Vdc power supply capable of lasting up to 30s in the absence of power and warning of lack of supply
- 4G router router with 24Vdc power
- Fuses
- Surge Protector
. MCB
- RCD
- 2Grid GATE
- 2Grid FEEDER
- 2Grid BULKER
- DIN rail socket to connect computer (optional, not included)
- Terminals for voltage inputs

2GRID GATE

Equipment for measuring all electrical parameters in the transformer secondary, as well as individual harmonics in V and A. The equipment includes the power cable, voltage measurement cables, Ethernet connector as well as current sensors of the 3F+N

2GRID FEEDER

Equipment for measuring all electrical parameters of the 3F+N of the 4 output lines. The equipment includes the power cable, the voltage measurement cables, the Ethernet connector as well as the current sensors of the 3F+N of the 4 lines

2GRID BULKER

Equipment for measuring all the parameters of the power transformer. The equipment includes the following sensors:

- Transformer Station Flood Sensor
- Temperature Sensor
- Humidity Sensor
- Transformer Oil Temperature Sensor

- The equipment has 4 inputs and 4 digital outputs to be able to monitor the status of switches or battery status or turn on/off forced ventilation, etc...

All 2GRID devices have the highest level of cybersecurity, detection, lifting, data erasure, cryptographic chip, no backdoor, hidden tracks, ...

The devices communicate with either Modbus or MQTT.

Use our sensors


sensors
smilics

Magnetic Flex

The Rogowski Magnetic Flex clamps have been designed with a sealable magnetic connector to hold both ends together for easy installation.
Its output ratio is 100 mV/1kA@50Hz

Magnetic Flex - Technical characteristics

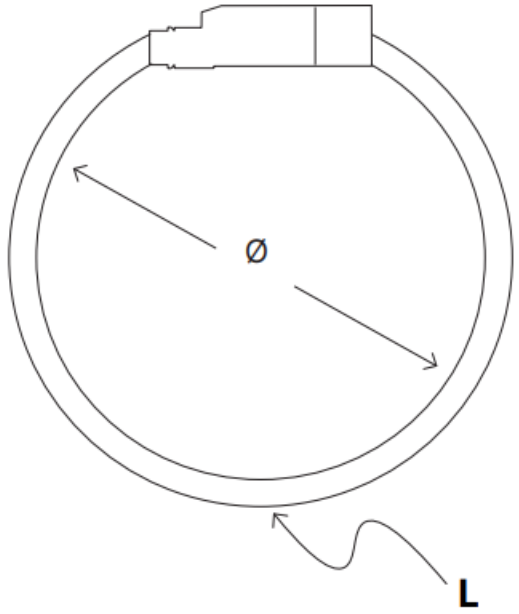
Electrical Characteristics	
Typical Output Voltage	100mV/kA@50Hz
Frequency Range	50Hz - 60Hz
Linearity (10% to 100%)	± 0.2%
Precision	± 1%
Max. temperature coefficient	± 0.05% / o C
Position Sensitivity	± 3%
External Fields	± 2%

Electrical Safety	
Isolation	Double
Protection class	II IEC/EN 61010- 1:2001
Surge Category	1000 V CAT III / 600 V CAT IV
Dielectric Strength	IEC/EN61010-2- 32:2002, 5.4kV 50Hz

Physical and Environmental Characteristics	
Wrap-around material	Autoextinguible UNE 21031 90ºC V0
Closure Material	PA V-0
Working Temperature	-20 a +80 o C
Storage temperature	-40 a +80 o C
Relative humidity	15 a 85% (sin condensación)
Degree of protection	IP54, IP65
Sensor Cable Diameter	8 mm
Sensor Cable Length	2 m

*Consult the data sheet for more detailed information

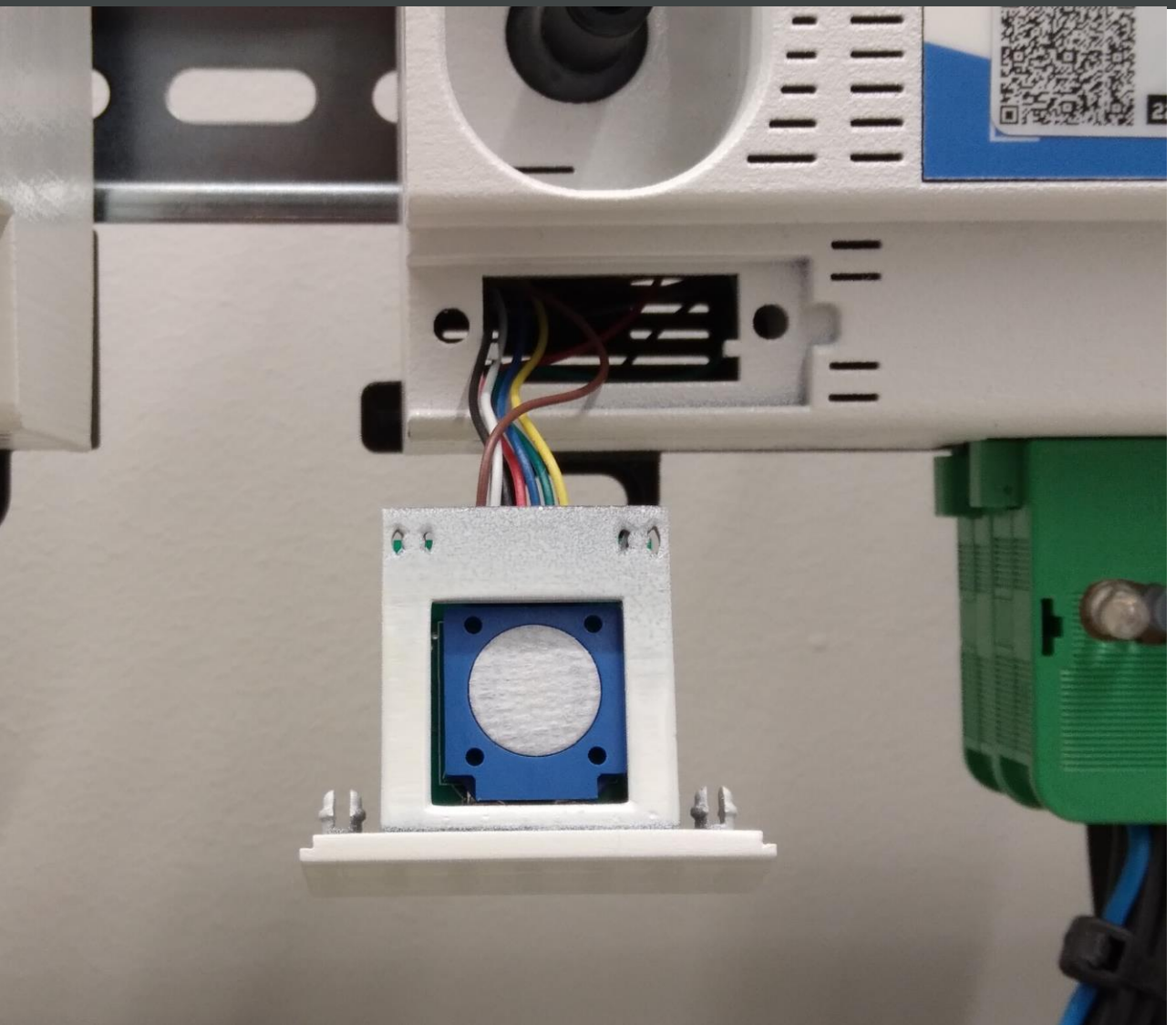
Magnetic Flex - Dimensions



Modelo	Ø	L
Magnetic Flex 70	70mm	219mm
Magnetic Flex 120	120mm	376mm
Magnetic Flex 200	200mm	628mm

TEMPERATURE SENSOR

- Extremely easy to install.
- Pre-wired with the connector
- High precision, 3-wire PT100
- Accuracy +/-0.3ºC



OZONE SENSOR

- Easy to replace so we don't have to break the security
- 5-year durability

OIL TEMPERATURE SENSOR

- We replaced the typical analog pressure gauge present in most power transformers.
- There are different sizes so that we can adapt to different types of transformers
- We can also replace it with meters with analog sensor and indication
- Like all of our sensors, it comes pre-wired to simplify installation
- PT100 3-wire with precision +/-0.3ºC

FLOOD SENSOR

- It is placed on the ground of secondary substations so that we can detect flooding even with a very low water level

- We have also made the accessory that allows you to attach the flood sensor so that it does not move.

- Like all our sensors, it comes pre-wired to simplify installation.

HIGH-PRECISION INFRARED SENSOR

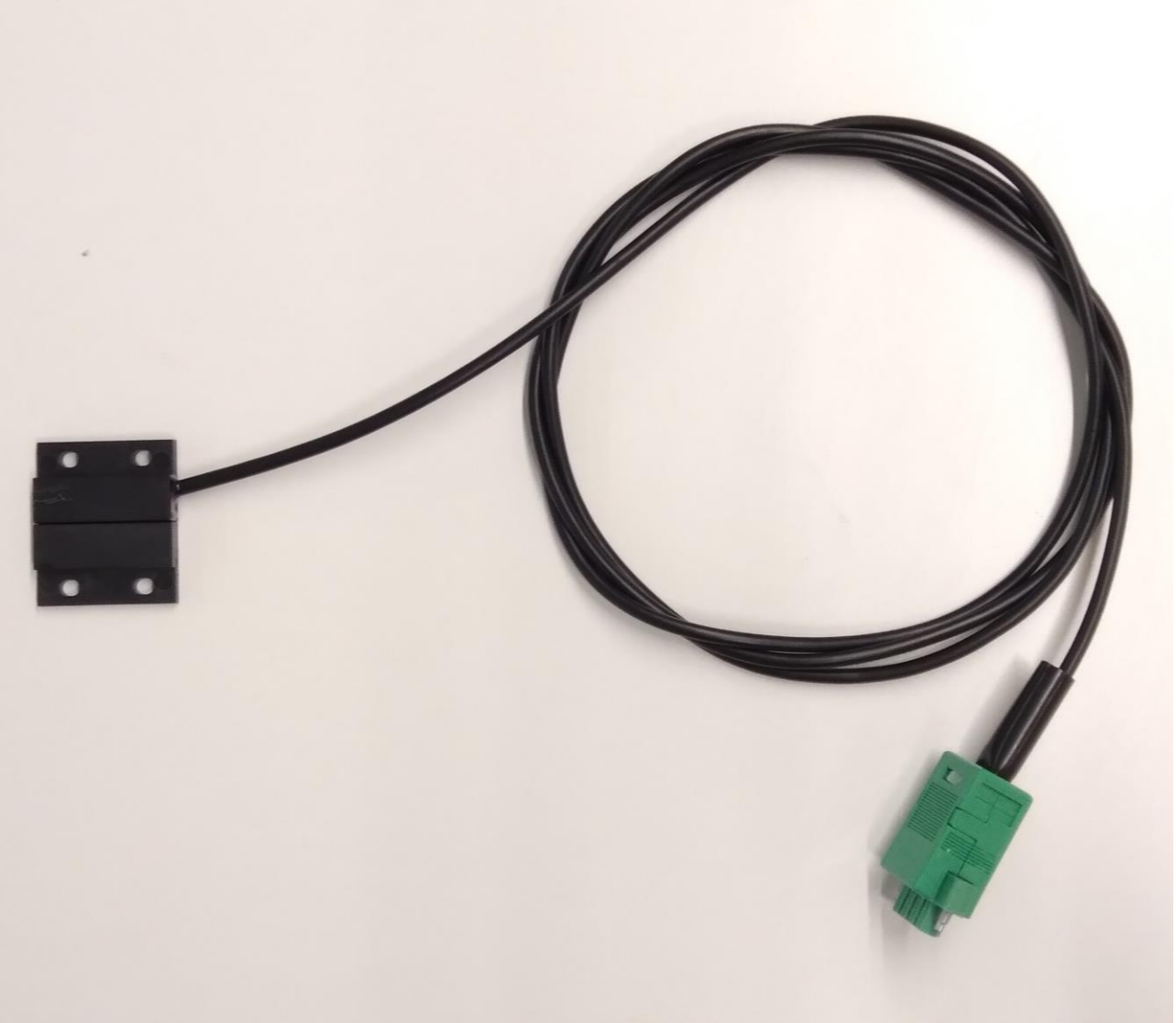
- X-Y rotation: +/- 15º
- Accuracy: +/-1ºC
- IR measurement distance of up to 2 m

OUTDOOR TEMPERATURE SENSOR

- PT100 3-wire
- Accuracy +/-0.3ºC

DARK SMOKE SENSOR

- Sensitivity ≥ 1 µg/m3
- Measurement Time 1s



ACCESS CONTROL SENSOR

- Magnetic door contact, normally open.
- 2-wire cable with 5 meters of cable to cover the distance to the device.

Your network, under control


smilics
TECHNOLOGIES